PERCEPTION AND CONCERNS OF MYANMAR DENTAL PRACTITIONERS TOWARDS TELEDENTISTRY

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Thesis submitted to
the Postgraduate Academic Board of Studies
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This thesis has been approved by the Board of Examiners.

Chief Examiner

Examiner (1) **Examiner (2)**

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ABSTRACT

Teledentistry is the practice of delivering oral health care, consultation and education using information technology and telecommunications. A cross-sectional descriptive study was conducted to determine the perception and concerns of Myanmar dental practitioners towards teledentistry. A validated 26-item, 5-point Likert scale, self-administered questionnaire was distributed to a Facebook community group of dental practitioners. This questionnaire inquired about sociodemographic and professional characteristics of respondents, their perception on the capability of teledentistry to improve dental practice, the usefulness of teledentistry for dental practice, the usefulness of teledentistry for patients and their concerns about teledentistry usage. Data were collected using Kobo collect platform and exported into SPSS version 25 for analysis. A total of 116 Myanmar dental practitioners completed this electronic survey. The majority of the respondents (78.5%) believed that teledentistry would reduce waiting lists while (77.6%) agreed that teledentistry would assist in more efficient referrals. More than half of the participants (66.4%) believed that teledentistry would enhance continuing dental education and clinical training. Moreover, they believed that teledentistry improved collaboration between professionals (83.6%) and promoted communication with patients (84.5%). Most of the respondents (86%) thought that teledentistry would be beneficial for patients residing in rural and remote areas by reducing unnecessary travel to specialist centers. As for the concerns about teledentistry usage, the highest concern was data security (80.7%) followed by digital forgery (71.5%), reliability of teledental equipment (68%) and patient consent (67.3%). More than half of the participants preferred oral medicine and community dentistry for application of teledentistry. There was no statistically significant difference between sociodemographic and professional characteristics of respondents and their perception and concerns about teledentistry. In spite of security concerns, the majority of Myanmar dental practitioners had positive perception about the usefulness of teledentistry to improve practice and benefit patients. Results of this study suggested that teledentistry training programs for all dental professionals as well as security protocols to protect data security and digital forgery are obligatory. By integrating teledentistry in current oral health system, equity of oral health care delivery between rural and urban areas of Myanmar will be enhanced in the future.

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LIST OF ABBREVIATIONS

ADA	American Dental Association
AGMP	Aerosol Generating Medical Procedures
BDS	Bachelor of Dental Surgery
DSMA	Defense Services Medical Academy
IADR	International Association of Dental Research
PCI	Peripheral Component Interconnect
RAM	Random Access Memory
TDA	Total Dental Access
TDS	Teledentistry Survey
US	United States
WHO	World Health Organization

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CHAPTER (1)

INTRODUCTION

1.1 Background Information

Teledentistry is the remote provision of dental care, advice, or treatment through the medium of information technology rather than through direct personal contact with any patient involved (Kumar *et al*., 2019). The idea of teledentistry rooted back in 1994 as total dental access (TDA) project by US Army which aimed to improve patient care and dental education. The terminology "teledentistry" was first used in 1997 when Cook defined it as "the practice using video-conferencing technologies to diagnose and provide advice about treatment over a distance (Tella, Olanloye and Ibiyeni, 2019). In 2024, International Association of Dental Research (IADR) defined teledentistry as the uses of information and telecommunication technology to provide oral healthcare services between an oral healthcare provider and a patient/recipient or other health care provider, who are separated by distance (Scheerman *et al*., 2024).

Teledentistry can be provided via two methods known as real-time consultation method and store-and-forward method. Real-time teledentistry involves a videoconferencing in which dental professionals and their patients at different locations may see, hear and communicate with one another. Store-and-forward teledentistry involves forwarding remotely-monitored clinical information, radiographs, laboratory test results and images to specialists for consultation and treatment planning (Tella, Olanloye and Ibiyeni, 2019). Other uses of teledentistry include delivering preventive care and dental education, as well as real-time monitoring of treatment progress when in-person follow-up is not practical (Cheuk *et al*., 2023).

The implementation of teledentistry has been widespread in the era of COVID-19 pandemic to mitigate transmission risks in dental settings where aerosol generating procedures are inevitable. Moreover, extensive travel restrictions and lockdowns during pandemic era favors the usage of teledentistry to manage emergency dental cases, by providing consultation, triage and assessment of patients, and drug prescriptions (Cheuk *et al*., 2023). Teledentistry has been integrated in various branches of dentistry to provide consultation, diagnosis, treatment planning and monitoring of patients when transportation of patient is difficult and costly (Jampani *et al*., 2011 ;

Cheuk *et al*., 2023). The use of teledentistry enhances inter-professional collaboration between general dental practitioners and dental specialists. It also allows dental specialists to treat patients remotely and thus reducing the cost of long-distance travels while reaching accurate diagnosis and prompt treatment plan. Implementation of teledentistry in dental care facilitates patients in rural and underserved communities while being more convenient and cost-effective and ensuring more proper referring channels (Wheler, 1999 ; Khokhar *et al*., 2022).

1.2 Problem Statement

The lower dentist-to-population ratio, inadequate dental facilities, high dental care costs, long travel times to dental facilities, lack of transportation, geographic hurdles to oral care, poverty, and cultural barriers are some of the barriers to oral health care services in rural areas. Teledentistry is one of the several oral health care modalities that have been explored as a result of these inequities in the availability and delivery of oral health care in rural and urban areas (Tella, Olanloge and Ibiyeni, 2019).

There is a shortage of dental specialists in Saudi Arabia. In the public and private sectors, there are 19,622 dentists in total, including 1526 consultants, 3373 registrars, and 14,723 residents, according to the Ministry of Health. The importance of teledentistry in diagnosing and treating complicated cases of patients residing in rural areas is primarily discussed because of these facts (Alshammari and Almaktoom, 2023).

There is insufficient number of dental workforce in Myanmar, dentist to population ratio being 1:16000 which is very much lower than WHO recommended ratio of 1:7500. According to the Myanmar Dental Council, there were 4539 registered dentists as of 2018. Army dentists who have received training from the Defense Services Medical Academy (DSMA) are also in shortage. Myanmar's low oral health status further indicates limited access to oral health services. Transportation issues are one of the barriers to providing dental healthcare services in some remote areas of Myanmar. There is currently no obvious methodological strategy for dealing with the shortage of healthcare workers, therefore an integrated approach is suggested to address this complicated issue (Tin-Htet-Oo, Tianviwat and Thitasmakul, 2021).

Advances in the practice of teledentistry are largely internet-based and are favoured by many factor such as low cost, efficacy, opportunity for better-documented consultation and simultaneous communication of multiple participants. However, some dentists have not fully accepted teledentistry because of the necessity

for appropriate training, pressure for instant responses and the possibility of a message from one practitioner to another being neglected or misunderstood. There are also some privacy concerns in the sharing of patient's information and records. (Sede, Ehizele and Chukwumah, 2023).

1.3 Justification

World Health Organization has recognized the importance of oral health in overall well-being. However, the disparity in oral health care still persists to dates, disproportionately affecting underserved populations. Limited access to oral healthcare is associated with higher prevalence of oral diseases leading to increased health and economic burdens on affected communities (Atchison *et al*., 2022). The need for wider reach of oral health care services has arisen over the years in both developed and developing countries. Access to qualified dental professionals, particularly dental specialists, is still challenging for people residing in rural and isolated areas of developing nations.

Geographical barriers, longer travel times to dental facilities, a lower dentist to population ratio, a lack of transportation to receive dental care, and inadequate dental facilities are some of the challenges to the equity of oral health care services. (Tella, Olanloye and Ibiyemi, 2019). Different modalities to overcome the discrepancy in oral health care delivery have been explored and teledentistry is one of them. Teledentistry has the potential to revolutionize oral health care delivery of remote and underserved areas by connecting the power of digital platforms for remote dental consultations, diagnosis and treatment planning.

To achieve better implementation of teledentistry, understanding how dental practitioners perceive it and identifying the obstacles in its usage is of critically importance. Although various studies on dental practitioners' perception towards teledentistry have been carried out in various countries, limited data was available for Myanmar dental practitioners. Therefore, the current study was conducted with the aim to identify the perception and concerns of Myanmar dental practitioners towards teledentistry. By conducting this study, Myanmar dental practitioners' perception and concerns about teledentistry were assessed and barriers for its use in dental health care provision were identified. Results of this study might be useful in integration of

teledentistry in future oral health planning and serving as a tool to enhance equity of oral health care between rural and urban areas in Myanmar.

CHAPTER (2)
LITERATURE REVIEW

Medical and dental science have advanced substantially since the introduction of telehealth technology decades ago. In the field of dentistry, the utilization of telehealth-related technologies has transformed diagnosis, treatment, and surgery (Heale, 2018; Maqsood *et al*., 2021). Teledentistry is a form of telehealth, using electronic information, imaging and communication technologies, including interactive audio, video, data communications as well as store and forward technologies, to provide and support dental care delivery, diagnosis, consultation, treatment, transfer of dental information, and education as defined by American Dental Association (ADA). It is the combined practice of modern telecommunication technology with routine dental management procedure, aiming to deal with dental treatment needs like emergency conditions in an effective and timely manner. It also aids in management of dental problems despite geographical distance, especially in rural, border and remote areas.

2.1 Development of Teledentistry

Teledentistry approach was developed as part of the dental informatics model, which was drafted at a meeting subsidized by the Baltimore-based Westinghouse Electronics Systems Groups in 1989. How to use dental informatics in dentistry practice to enhance the provision of oral health care was the main topic of discussion (Chen *et al*., 2003). The first practical application of teledentistry was used in a US project launched in 1994 to assess the dental health of servicemen of United States army (Maqsood *et al*., 2021). It includes dental consultations on person located more than 100 miles apart. Since then, various institute and organizations used teledentistry with varying degree of success.

Usage of teledentistry progressed rapidly with the increased incidence of COVID-19. Teledentistry was the protocol of choice during COVID-19 pandemic era when the possibility of cross infection substantially decreased access to dental care. Aerosol-generating medical procedures (AGMP) were an important concern in dental settings during the recent COVID-19 pandemic, contributing to the majority of COVID-19 transmission risks in dental operatories (Cheuk *et al*., 2023).

As a result, North American dentists started utilizing virtual teledentistry techniques to conduct consultations, evaluate and triage patients, write prescriptions, and refer patients to specialists. In the US, researchers want to improve patient acceptability of mobile dentistry platforms that use intraoral cameras to provide virtual oral examinations, treatment planning, and oral health management. In Canada, teledentistry was employed in the early stages of the pandemic to triage dental patients and assess whether or not drugs prescriptions could delay odontogenic infections. In contrast to clinical settings, teledentistry was used to develop guidance for appropriate intraoral photography for the screening and triaging of potentially malignant oral lesions in the home (Cheuk *et al*., 2023).

Teledentistry became widespread and was implemented during the pandemic even by the low-income countries in the Southeast Asia for two key reasons: due to necessity of lockdown measures at this time that reduced the availability of face-to-face dental practice and cost-effectiveness of this method (Alotaibi & Alshehri, 2022). During COVID-19 pandemic, the Indonesian government encouraged the use of teledentistry, enabling effective patient screening; prioritize patients' needs, supporting self-quarantine measures thus protecting patients, health care workers and community from the exposure of COVID (Soegyanto *et al*., 2022). Teledentistry was used during pandemic for education, consultation and triage; it was also beneficial for older and vulnerable population (Sede, Ehizele and Chukwumah, 2023).

2.2 Methods of Teledentistry

The practice of dentistry in many parts of the world has developed to the point where dental clinics with computerized patient registry, electronic invoicing, digital radiography, 3D computerized systems for prosthetic dental reconstruction, 3D cone beam computed tomography and other high quality computerized appliances are now commonplace (Irving *et al*., 2018). The first description of teledentistry focused only on videoconferencing and its relationship to remote consultation and diagnostics. The 21st century's fast advancing technology caused it to broaden its scope to encompass subdomains like telemonitoring, telediagnosis, teleconsultation, and tele-triage. (Maqsood *et al*., 2021).

Teleconsultation through teledentistry can principally take place in either of the following ways; “Real-Time-Consultation” and “Store- and-Forward Method”. To enable a live video conferencing, a widely available standalone IP/ISDN videoconferencing solution must be employed or a PCI codec board must be installed into the system (Jampani *et al*., 2011). Real-time consultation facilitates immediate interaction between dentists and patients through video conferencing, enabling sharing of data and medical history (Kanani *et al*., 2024). A form of real-time-consultation is “Remote Monitoring Method”. This includes monitoring of patients at a distance and can either be hospital-based or home-based. It allows continuous patient evaluation from a distance, improving healthcare delivery and patient safety.

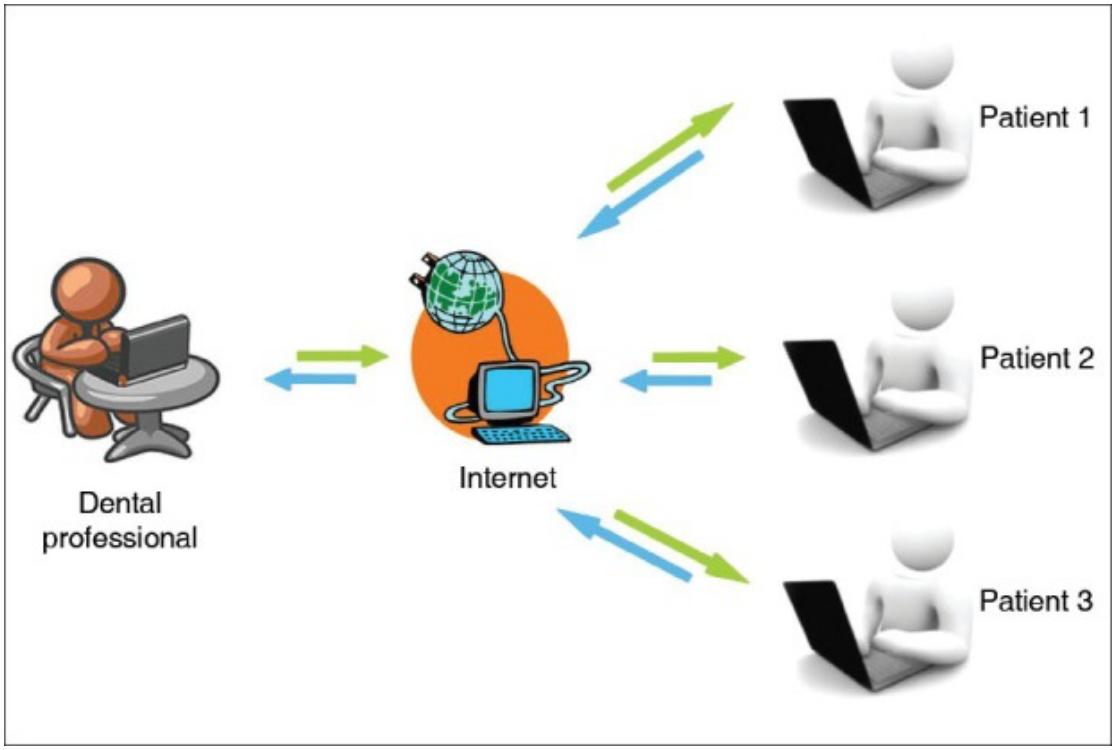

Fig 2.1 Real-time consultation (Jampani *et al*., 2011)

A typical store-and-forward teledentistry system consists of a computer with substantial hard drive memory, adequate RAM, a speedy processor, an intraoral camera and/or a digital camera, a modem and internet connection. For most dental applications, store-and-forward method provides excellent results without excessive costs for equipment or connectivity (Jampani *et al*., 2011). The store-and-forward method involves the collection and transmission of essential diagnostic materials, enhancing diagnostic accuracy (Kanani *et al*., 2024). This allows collaboration between general practitioners and specialist regarding a patient and the necessary treatment for this patient. It involves the local dentist digitizing and electronically transmitting

clinical photographs, and X-rays to the specialist and thus enables the specialist to make a diagnosis and recommend treatment options or referral.

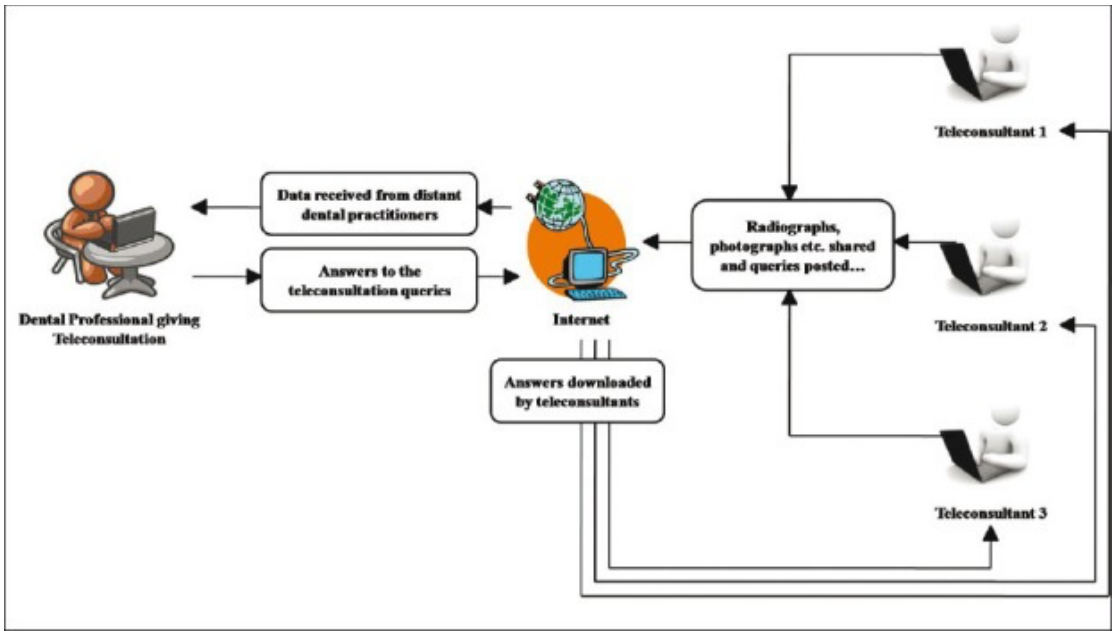

Fig 2.2 Store-and-forward method (Jampani *et al*., 2011)

2.3 Advantages and Limitations of Teledentistry

Teledentistry allows networking, sharing digital dentistry information, distant consultations, workup of patients and remote analysis of their clinical and laboratory information. General dentists can send multimedia patient records to dental specialists, allowing them to diagnose and formulate treatment plans without the need for long distance travels. It also enhances improved dental integration within the broader healthcare delivery system (Chhabra *et al*., 2011; Agarahari *et al*., 2023). The beneficiaries of teledentistry will not only be the vulnerable patient but also the oral health teams that can work together in productive novel ways.

The practice of teledentistry are largely internet based and favored by many for their speed, low cost, efficacy, opportunity for better documented consultation and simultaneous communication of multiple participants. Some studies have shown that application of teledentistry in daily practice is not always well accepted. Several challenges in teledentistry usage have been identified, which includes confidentiality related to patient data, informed consent, risk of misdiagnosis, and financing problems related to consultation services in teledentistry (Soegyanto *et al*., 2021). However, Some dentists have not fully embraced teledentistry due to the need for proper training,

pressure to respond immediately, and the potential for a message sent from one practitioner to another to be neglected or misunderstood (Sede, Ehizele and Chukwumah, 2023).

2.4 International Studies on Perception of Teledentistry

An anonymous electronic survey among a sample of 169 Australian dental practitioners found that more than 80% of respondents agreed or strongly agreed that teledentistry would improve dental practice through enhancing communication with peers, guidance and referral of new patients. The majority also felt that teledentistry is quite useful in improving patient management, and increasing patient satisfaction. A substantial proportion of respondents expressed uncertainty with technical reliability, privacy, practice expenses, the cost of setting up teledentistry, surgery time and diagnostic accuracy (Estai, Kruger and Tennant, 2016).

A descriptive cross-sectional study involving an electronic survey was done among 286 Saudi Arabian dental professionals. It was found more than 70% of respondents agreed or strongly agreed that teledentistry would improve dental practice through enhancing communication with peers, guidance and referral of new patients. A substantial proportion of respondents (60-70%) expressed uncertainty with technical reliability, privacy and diagnostic accuracy. The participants' qualification was statistically significant with usefulness of teledentistry for patients ($p = 0.027$), while work experience in years was statistically significant with both usefulness of teledentistry for dental practice and patients ($p = 0.046$ and <0.0001 respectively). Regarding the application of teledentistry, the majority of respondents selected community dentistry followed by oral medicine, dental hygiene, and half of the participants selected orthodontics. (Al-Khalifa and Al-Sheikh, 2020).

An electronic survey by Maqsood *et al*. (2021) among dental professionals revealed more than half (50-70%) of the participants endorsed that teledentistry is a useful tool for improving patient care and clinical practice. Two-third of the patients (69.96%) considered it can reduce the cost of oral health care delivery. However, more than half of participants also showed concern such as confidentiality of patient data. In the fields of oral medicine, periodontics and operative dentistry, the majority of participants recommended using teledentistry. There was a significant difference between the age, experience of dental practitioners, and their qualifications with their perception and concerns of teledentistry.

In Malaysia, cross sectional descriptive study to assess the perception of Malaysian dental practitioners towards teledentistry was conducted. More than 60% of respondents agreed that teledentistry would benefit the dental practice through enhancement of communication with peers, guidance, and new patients' referral. However, a substantial proportion of practitioners (70-80%) expressed uncertainty with accuracy of diagnosis, technical reliability, and privacy. Regarding the application of teledentistry, community dentistry and dental hygiene were chosen by the majority of respondents, followed by oral medicine, pedodontics, and oral radiology (Khokhar *et al*., 2022).

In 2022, it was reported that Indonesian dentists had positive perception of teledentistry as a means of enhancing dental practice and its benefits. It was a descriptive cross-sectional study that included 652 Indonesian dentists who completed an electronic survey. In that study, 87% of respondents agreed the usefulness of teledentistry especially for saving time but they showed concerns about its usage in terms of digital forgery. The dental practitioners' perception about teledentistry for patients was significantly altered by their work experience ($p = 0.039$). Community dentistry and oral medicine (82.5%) are the two specialties that were chosen for which teledentistry was mostly applicable. The specialty least preferred to be applied in teledentistry was oral surgery (Soegyanto *et al*., 2022).

An Indian study reported 94.7% of dental professionals agreed teledentistry is a useful method in fulfilling dental health needs of community to a great amount. While the participants exhibited positive perception towards teledentistry, they still express the uncertainty and challenges they may face while using teledentistry. Lack of training, advanced infrastructure needs and internet connectivity were their major concerns (Raja *et al*., 2022).

A cross-sectional study using an online survey was conducted among Ontario dentists to access teledentistry usage during COVID-19 pandemic and to explore their perception on the method. Nearly half of the respondents (49.3%) reported using teledentistry; (13%) started even before the pandemic and 36% during the pandemic. More than half of participants indicated that teledentistry is reliable for patient triaging and patient follow-ups (Cheuk *et al*., 2023).

In Turkey, a questionnaire prepared in Google document was shared among dentists. This result showed 86.9% dentists stated that they would like to use teledentistry for radiological examinations and some follow-up examinations and

82.4% would like to discuss with other dentists through teledentistry (Ozveren *et al*., 2023).

2.5 Study on Teledentistry in Myanmar

The only Myanmar study on knowledge and attitude of undergraduate dental students from University of Dental Medicine, Yangon towards teledentistry revealed that the majority of students knew well about what is teledentistry. But majority of the students from final BDS (61.8%) knew that teledentistry has limited use in dentistry. Most of the students agreed that teledentistry can provide a good understanding of the patient's oral health problem over the internet. Moreover, fourth year students (75%) agreed that teledentistry is convenient form of oral health care delivery which makes dental examination easie (Zaw-Moe-Thein *et al*., 2020).

2.6 Conceptual Framework

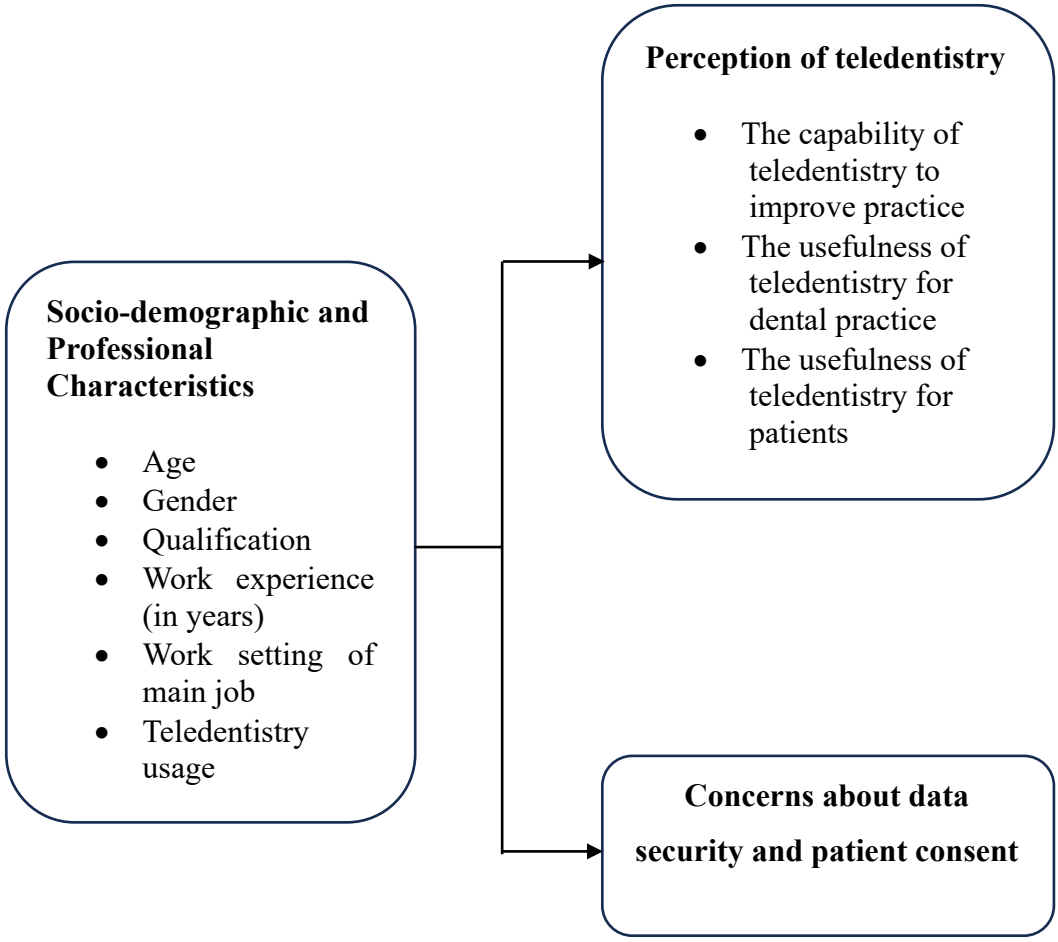
Perception of teledentistry
The capability of teledentistry to improve practice
The usefulness of teledentistry for dental practice
The usefulness of teledentistry for patients
Socio-demographic and Professional Characteristics
Age
Gender
Qualification
Work experience (in years)
Work setting of main job
Teledentistry usage
Concerns about data security and patient consent

Fig 2.3 Conceptual Framework of perception and concerns of teledentistry among Myanmar dental practitioners

CHAPTER (3)
OBJECTIVES

3.1 General Objective

To study the perception and concerns of Myanmar dental practitioners towards teledentistry

3.2 Specific Objectives

1. To describe the perception on teledentistry among Myanmar dental practitioners
2. To find out the concerns about teledentistry among Myanmar dental practitioners
3. To assess dental practitioners' opinion regarding the preferred dental specialties for application of teledentistry
4. To determine association between respondent's sociodemographic and professional characteristic and their perception and concerns about teledentistry

3.3 Research Questions

1. What are the perceptions about the use of teledentistry among the dental professionals in Myanmar?
2. What are the concerns about teledentistry among Myanmar dental practitioners?
3. What are the dental practitioners' opinion regarding the preferred dental specialties for application of teledentistry?
4. Is there any association between respondent's sociodemographic and professional characteristic and their perception and concerns about teledentistry?

CHAPTER (4)

RESEARCH METHODOLOGY

4.1 Study Design

The study design was cross-sectional descriptive study.

4.2 Study Period

The study was performed from September to December, 2024.

4.3 Study Area

The study area was Facebook community group of Myanmar dental practitioners.

4.4 Study Population

The study population consisted of currently practicing Myanmar dental practitioner who were members of Facebook community group of dental practitioners. The dental practitioners who did not provide informed consent were excluded from the study.

4.5 Sample Size Determination

Sample size determination was calculated by following formula and assumption

$$\mathbf{n} = \frac{z^2_{1-\frac{\alpha}{2}}\ \sigma^2}{d^2}$$ (Lemeshow *et al*, 1990)

Where:

n = minimum required sample size

z = 95% confidence interval or 1.96

σ = population standard deviation (usefulness of teledentistry for patients)

= 4.9 (Al-Khalifa and Al-Sheikh, 2020)

d = margin of error = 0.84

$$\mathbf{n} = \frac{\mathbf{1.96^2}_{\times}\ \mathbf{4.9^2}}{\mathbf{0.84^2}}$$

n = 96

Accordingly, the required sample size was 96 dental practitioners for this study. Ten percent of the sample size was needed to increase for compensating the nonresponse rate. Therefore, the minimum required sample size was 106.

4.6 Sampling Procedure

Dental practitioners from a Facebook community group were purposively selected for this study. The group comprised approximately 200 dental practitioners who were residing in various States and Regions of Myanmar. All members of this group who gave informed consent were involved in this study. Data were collected until the minimum required sample size was obtained.

4.7 Data Collection Methods and Tools

A descriptive cross-sectional study involving an electronic survey was conducted among dental practitioners in Myanmar. A validated 26-item, 5-point Likert-scale questionnaire were used to assess perceptions and concerns of teledentistry among Myanmar dental practitioners. The questionnaire developed by Estai, Kruger and Tennent (2016) was used in this study. The construct validity of this questionnaire was assessed by Alsharif *et al*. (2024) and reported an overall Cronbach alpha value of 0.85.

Data was collected using the Kobo collect platform. An electronic-based self-administered questionnaire was distributed to dental practitioners who gave informed consent in a Facebook community group of dental practitioners. The invitation to participate in this study was opened for 2 weeks. The questionnaire consisted of four sections. The first section gathered sociodemographic and professional characteristics of participants. In the second section, there were twenty-one 5-point Likert-type questions divided into three domains regarding dental practitioners' perception on the capability of teledentistry to improve dental practice, usefulness of teledentistry for the dental practice and usefulness of teledentistry for patients. The third section consisted of five 5-point Likert-type questions addressing concerns related to data security and patients consent in teledentistry. The final section focused on dental practitioners' opinions regarding dental specialties for the application of teledentistry. An informed consent page were included in the online form, and dental practitioners who agreed to participate completed this survey.

Grading of Scores

Questionnaire included 21 questions about perception of teledentistry and 5 questions for dental practitioners' concern related to data and security in teledentistry. For perception section, 5-point Likert scale was used in which 1 "Strongly disagree", 2 "Disagree", 3 "Neutral", 4 "Agree", 5 "Strongly agree. For concern section, 5-point Likert scale was used in which 1 "Very concerned", 2 "concerned", 3 "Not feeling either way", 4 "Not particularly concerned", 5 "Not concerned at all". The minimum and maximum scores for perception were 21 and 105, while 5 and 25 for concerns.

4.8 Data Management and Analysis

The collected data was entered into Kobo collect excel and exported into SPSS (Statistical Package for Social Science) version 25, where it was cleaned, edited, coded, and exploratory data analysis was performed to check for missing values and influential outliers. Continuous variables were presented as mean, SD. Categorical variables were expressed as frequency (percentage). ANOVA test and independent sample T-test were used to determine association between respondents' sociodemographic and professional characteristic and their perception and concerns on teledentistry. Foremost, significant factors that had a p-value less than 0.25 were analyzed with the multiple linear regression. P value of < 0.05 was considered as level of significance. After analyzing the collected data, findings were expressed by appropriate figures, graphs and tables.

4.9 Ethical Considerations

The study was approved by Institutional Review Board, University of Public Health, Yangon UPH-IRB (2024/MPH/5) on 30th October 2024, and being conducted according to guidelines issued by the UPH-IRB. The data collection through an electronic based self-administered questionnaire was done only after a thorough explanation of the purpose of the study to participants and obtaining informed consent. A survey link was sent to the facebook group, with the consent form included on the first page. Only those who gave consent were able to proceed for answering the questions. The confidentiality was maintained throughout the whole research.

CHAPTER (5)
FINDINGS

A cross-sectional descriptive study was conducted to determine perception and concern of Myanmar dental practitioners towards teledentistry by using electronic based self-administered questionnaire. A total of 116 dental practitioners from facebook community group in Myanmar participated in this study.

Table (5.1) Sociodemographic characteristics of the respondents (n=116)

Variables	Frequency	Percentage (%)
Age in years		
24 – 34	63	54.3
35 – 45	38	30.2
> 45	15	15.5
Gender		
Male	53	45.7
Female	63	54.3
Qualification		
Bachelor	83	71.5
Master	16	13.8
Doctorate	17	14.7
Residence (State and Region)		
Yangon	91	78.5
Mon	7	6.0
Mandalay	7	6.0
Ayeyarwady	3	2.6
Nay Pyi Taw	3	2.6
Tanintharyi	2	1.7
Shan	1	0.9
Sagaing	1	0.9
Bago	1	0.9

The sociodemographic characteristics of participants were described in table (5.1). Among the 116 participants, the eldest age was 79 years, the youngest age was 24 years and mean age was 35.8 ± 10.05 years. More than half of the participants, 63 (54.3%) were in the age range of 24 to 34 years and 35 (30.2%) were aged between 35 and 44 years. More than half of them (54.3%) were female. The majority of respondents' qualifications were bachelor 83 (71.6%), followed by doctorate 17 (14.66%), and master degree 16 (13.8%). The majority of respondents, 91 (78.5%), lived in Yangon, with the remaining individuals residing in Mon, Mandalay, Ayeyarwady, Nay Pyi Taw, Tanintharyi, Shan, Sagaing, and Bago respectively.

Table (5.2) Professional characteristics of the respondents (n=116)

Variables	Frequency	Percentage (%)
Work setting of main job		
In Service	60	51.7
Private Dental Clinic	56	48.3
Work Experience in years		
1 – 5	34	29.3
6 – 10	37	31.9
11 – 15	21	18.1
> 15	24	20.7
Working hours per week (hours)		
< 20	31	26.7
20 – 39	29	25.0
40 – 59	41	35.3
> 59	15	12.9
Daily general-purpose use of internet (hours)		
< 2	11	9.5
2 – 4	66	56.9
5 – 7	23	19.8
> 7	16	13.8
Daily practice-related use of internet (hours)		
< 2	67	57.8
2 – 4	36	31.0
5 – 7	7	6.0
> 7	6	5.2
Experience of teledentistry usage		
Yes	39	33.6
No	77	66.4
Plan for practicing teledentistry in future (n=77)		
Yes	62	80.5
No	15	19.5

The professional characteristics of participants were described in table (5.2). Slightly more than half of the respondents 60 (51.7%) were working in government sector and the remainders 56 (48.3%) were private dental practitoners. Highest percentage of respondents (31.9%) had working experience between 6-10 years, followed by 29.3% having 1-5 years, 20.7% were above 16 years of working experience. Maximum and minimum working experience were 52 years and 1 year and mean working experience was 10.82 ± 9.11 years. About one-third of respondents 41 (35.3%) worked 40-59 hours per week, a quarter of respondents 29 (25%) worked 20-39 hours per week. Maximum working hours per week was 90 hours, minimum was 5 hours, and mean working hours per week was 34.89 ± 21.79 hours. In terms of internet use, this study showed that above half of the dental practitioners 66 (56.9%) spent an average of 2-4 hours daily on general use of internet. For daily internet use for dental practice, 67 (57.8%) of dental practitioners used the internet for less than two hours. Most of the respondents 77 (66.4%) had never used teledentistry before. Among those who have no experience using teledentistry, 80% of the respondents were willing to use teledentistry in future.

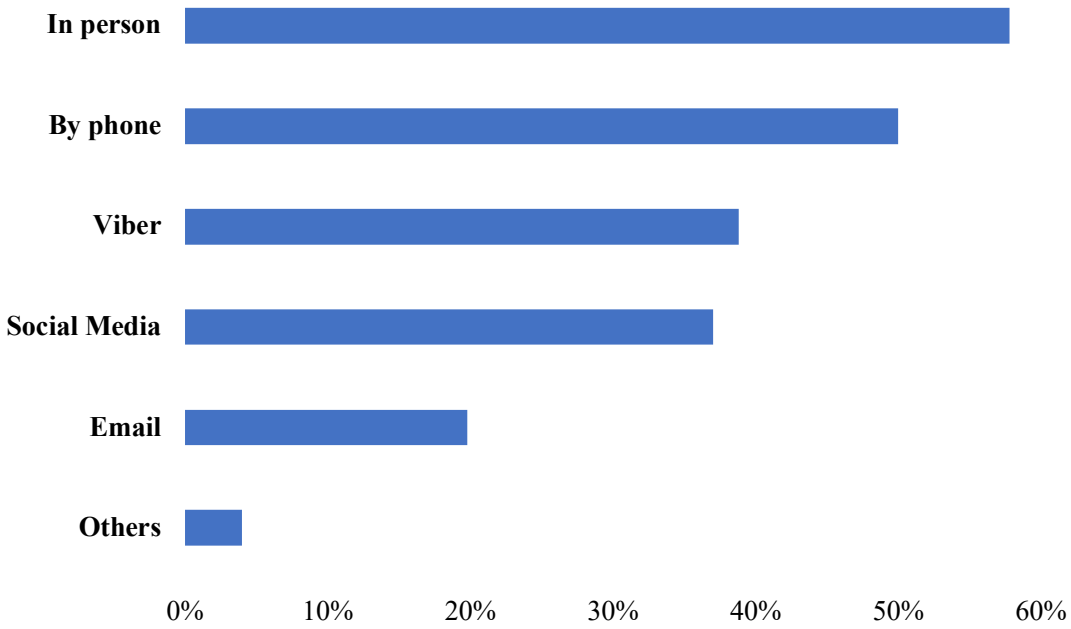

Fig (5.1) Preferred communication channels among dental practitioners (Multiple response)

The most popular methods of communication chosen by the respondents were as follows: in-person (57.8%), by phone (50%) and viber (38.8%), socia media (37%) and email (19.8%). The least chosen communication methods among the respondents were the usage of others, including zoom, wechat and line.

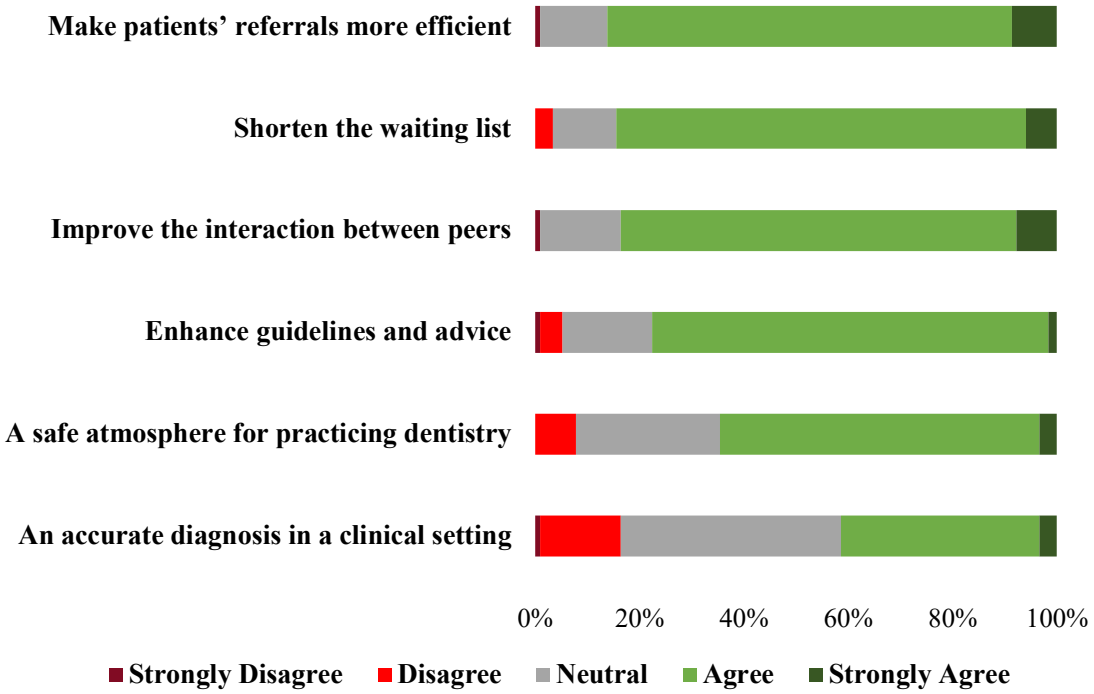

Fig (5.2) Dental practitioners' perception of the capability of teledentistry to improve practice (n=116)

Most of the respondents 90 (77.6%) were in agreement that teledentistry would assist in more efficient referrals. Over three-quarters of the respondents 91 (78.45%) agreed that teledentistry would help reduce the waiting list. A clear majority 97 (83.6%) agreed and strongly agreed that teledentistry would improve communication between professionals. A large portion, 88 (75.8%) of respondents agreed that teledentistry would enhance treatment guidelines and advice. More than half of respondents 71 (61.2%) agreed that teledentistry would provide a safe atmosphere for practicing dentistry but above a quarter of the respondents 31 (27.6%) were not sure about that. Although nearly half of respondents 49 (42.2%) indicating uncertainty if teledentistry would provide an accurate diagnosis in a clinical setting, more than 41.3% of respondents agreed that statement as shown in Fig (5.2).

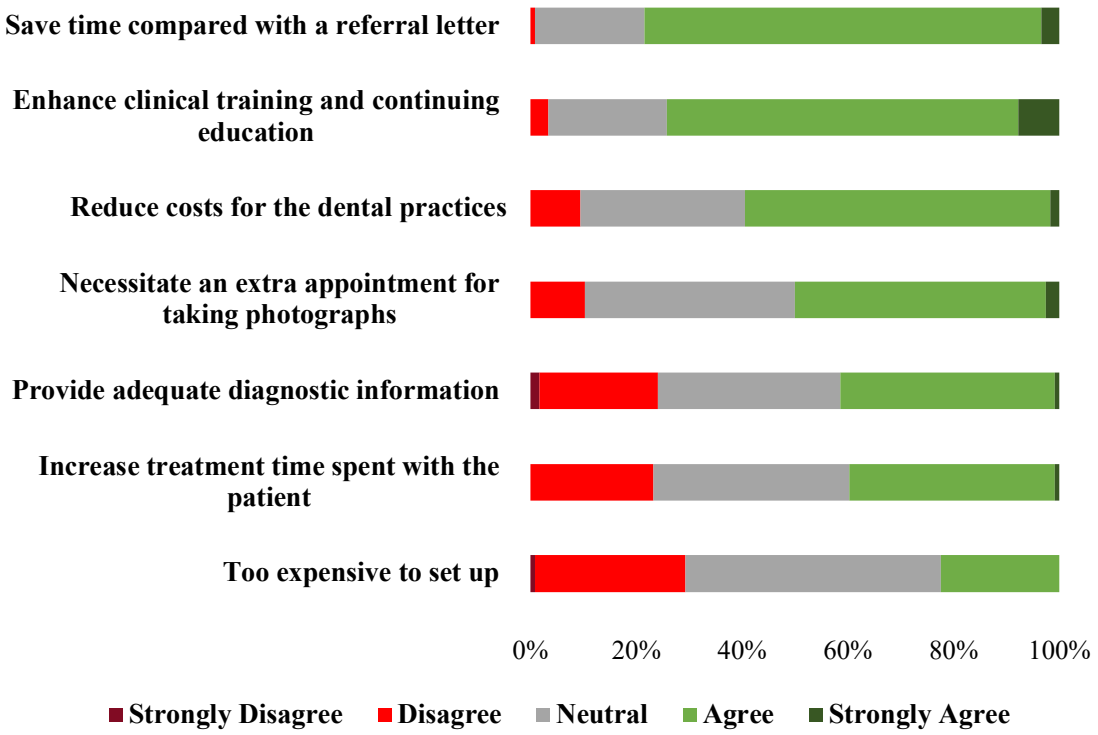

Fig (5.3) Dental practitioners' perception of teledentistry usefulness for the dental practice (n=116)

The majority of respondents 91 (78.4%) indicated that teledentistry could be quite useful in improving dental practice by saving time when compared to conventional referral. In accordance with the most of the participants, 77 (66.4%), it was deduced that teledentistry would be beneficial to a dental practice by enhancing continuing education and clinical training. More than half of the respondents 69 (59.5%) agreed that teledentisty reduce costs for practice but 36 respondents (31%) were not sure about that statement. Nearly half of the respondents 55 (47%) felt that teledentistry would require extra appointments for photography. Even though 47 (40%) of respondents were certain that teledentistry would provide sufficient diagnostic information, above one-third of respondents 40 (34.5%) were not sure, and over 26 (22.4%) of respondents disagreed. Nearly 40% (39.7%) of the participants agreed upon teledentistry increasing treatment time spent with the patient but 37% were not convinced about that statement, while 23% disagreed. Almost half of the respondents 56 (48.3%) were not sure if teledentistry would be too expensive to set up, while respondents 33 (28.4) disagreed.

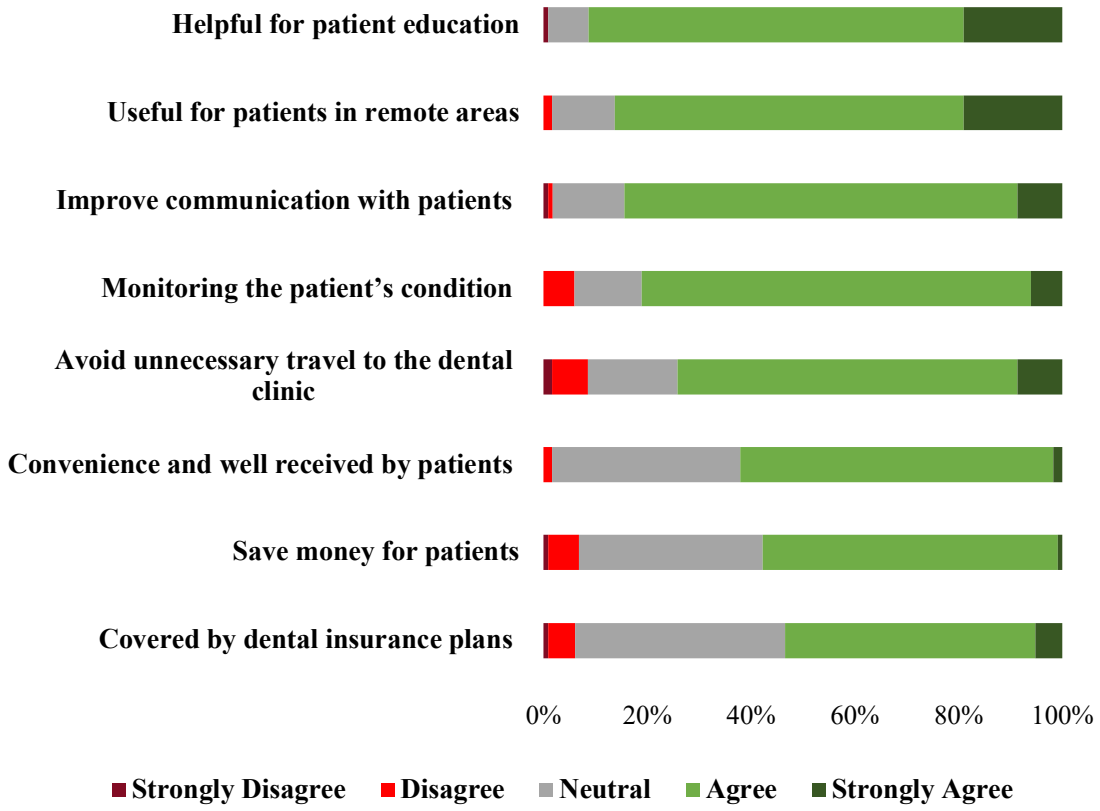

Fig (5.4) Dental practitoners' perception of the usefulness of teledentistry for patients (n=116)

The majority 106 (91%) of respondents showed that teledentistry would be helpful for patient education. One hundered respondents (86%) mentioned that teledentistry would be beneficial for patients residing in rural or remote locations. A similar agreement percentage (75%) was seen in regards to whether teledentistry would be helpful in monitoring the patient's condition and that it would improve communication with patients. Seventy-six respondents (65.5%) were convinced that teledentistry would help to avoid unnecessary travel to the dental clinic. More than half of the respondents, 70 (60.3%), agreed that teledentistry can be convenient and well received by the patients. Above half of respondents, 67 (57.8%), agreed and strongly agreed that teledentistry would save money for patients. Slightly more than half of the respondents, 62 (53.5%), showed a positive perception that teledentistry should be covered by dental insurance plans, but 47 (40.5%) were not sure about that statement.

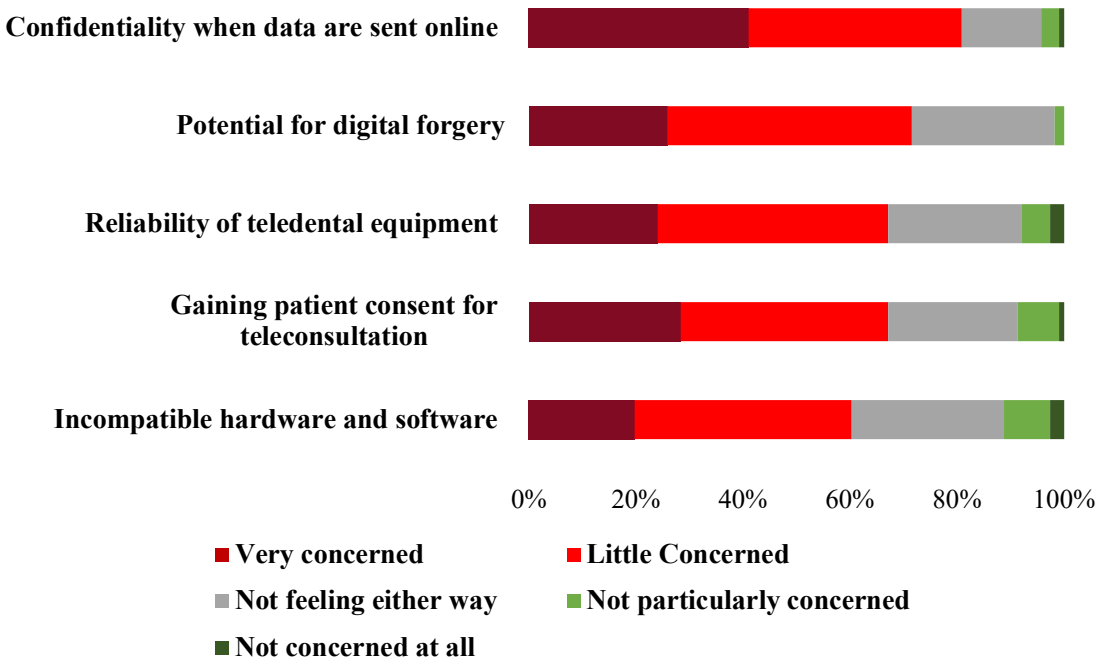

Fig (5.5) Dental practitioners' concerns about data security and patients' consent (n=116)

Regarding questions concerning issues, the highest number of significant concerns expressed by respondents 94 (80.7%) was related to potential violations of confidentiality when data were sent online. Concern about potential for digital forgery came in second place, where 83 (71.5%) of respondents expressed little or significant concerned. On reliability of dental equipment, 79 (68%) of respondents expressed little concerns and very concernd. Similarly, 78 (67.3%) of respondents showed concerns on gaining patient consent for teleconsultation. The least concerning matter was hardware and software incompatibility 70 (60.3%) as shown in Fig (5.5).

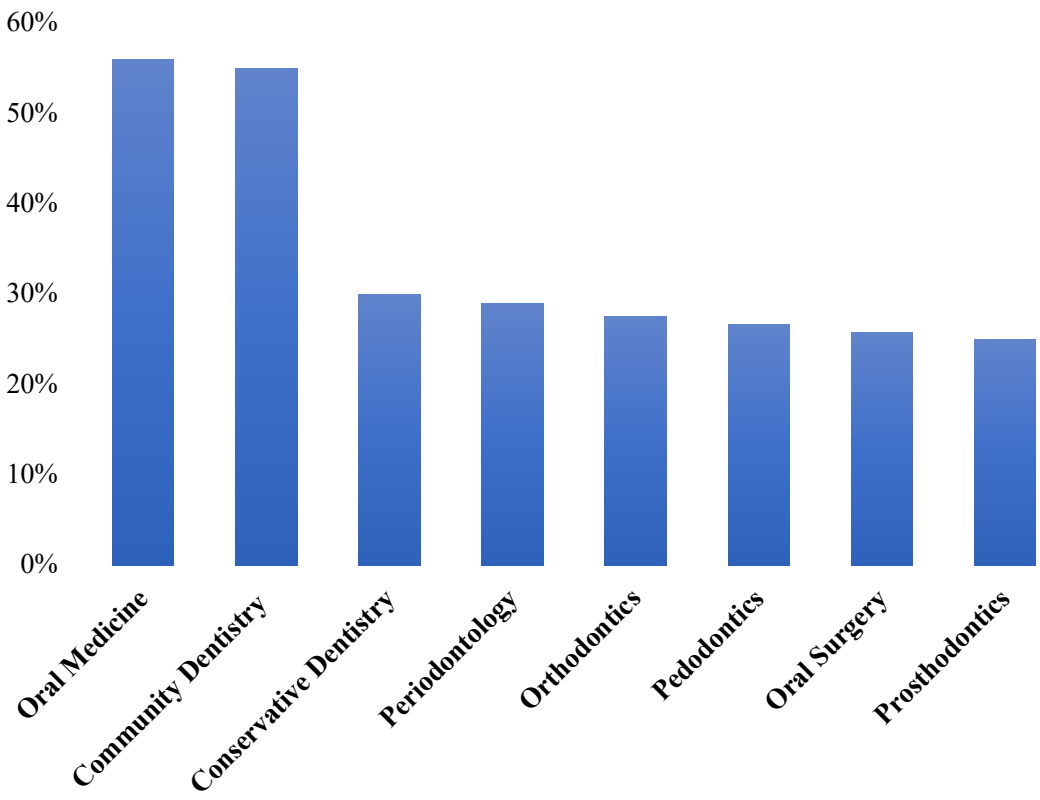

Fig (5.6) Preferred dental specialties for application of teledentistry (Multiple response)

Oral medicine and community dentistry are the two specialties that were chosen for which teledentistry was mostly applicable with over 50% of response . This was followed by conservative dentistry with 30% of response. The remaining dental specialties scored less than 30% of the response from the participants. The specialtiy least preferred to be applied in teledentistry was prosthodontics (25%).

Table (5.3) Association between sociodemographic variables of the respondents and three domains of perception about teledentistry (ANOVA test)

Variables	The capability of the teledentistry to improve practice Mean (SD)	The usefulness of the teledentistry for dental practice Mean (SD)	The usefulness of the teledentistry for patients Mean (SD)
Age (years)			
24 – 34	22.6 (2.6)	23.8 (2.6)	30.3 (2.8)
35 – 45	21.9 (2.0)	23.9 (2.8)	30.2 (2.8)
> 45	22.1 (2.7)	23.2 (2.3)	30.0 (2.5)
P value	0.449	0.677	0.952
***Gender**			
Male	22.1 (2.6)	24.2 (2.6)	30.2 (2.8)
Female	22.5 (2.2)	23.4 (2.6)	30.2 (2.8)
P value	0.316	0.590	0.797
Qualification			
Bachelor	22.4 (2.3)	24.0 (2.7)	30.1 (2.9)
Master	21.6 (2.7)	23.0 (2.3)	29.9 (2.6)
Doctorate	22.5 (2.6)	23.3 (2.5)	30.2 (2.4)
P value	0.415	0.260	0.870
Work Experience (years)			
1 – 5	22.1 (2.6)	23.6 (2.3)	29.8 (2.9)
6 – 10	22.7 (2.4)	23.9 (2.7)	30.4 (2.7)
11 – 15	22.5 (2.0)	24.5 (2.8)	30.8 (2.9)
> 15	21.9 (2.5)	23.3 (2.7)	29.9 (2.7)
P value	0.608	0.436	0.532
***Work setting of main job**			
In Service	22.6 (2.4)	24.1 (2.6)	30.1 (2.7)
Private Clinic	22.0 (2.4)	23.5 (2.7)	30.4 (2.9)
P value	0.821	0.537	0.799

Variables	The capability of the teledentistry to improve practice Mean (SD)	The usefulness of the teledentistry for dental practice Mean (SD)	The usefulness of the teledentistry for patients Mean (SD)
***Experience of teledentistry usage**			
Yes	22.5 (2.2)	23.4 (2.9)	30.7 (2.5)
No	22.2 (2.5)	23.9 (2.5)	29.9 (2.9)
P value	0.707	0.400	0.545
Range	6 – 30	7 – 35	8 – 40
Total	22.3 (2.4)	23.8 (2.6)	30.2 (2.8)

*Independent sample T-test was used

Table (5.4) Association between sociodemographic variables of the respondents and their perception and concerns about teledentistry (ANOVA test)

Variables	Perception of advantages of teledentistry in improving dental practice and patient care Mean (SD)	Concerns about data security and patients' consent Mean (SD)
Age (years)		
24 – 34	76.7 (6.1)	10.8 (2.6)
35 – 45	76.1 (6.0)	10.6 (3.2)
> 45	75.1 (6.4)	9.2 (3.8)
P value	0.411	0.173
***Gender**		
Male	76.5 (6.7)	10.7 (3.2)
Female	76.1 (5.4)	10.3 (2.8)
P value	0.115	0.147
Qualification		
Bachelor	76.7 (6.1)	10.7 (2.9)
Master	74.4 (5.9)	10.5 (3.4)
Doctorate	75.8 (6.4)	9.6 (3.3)
P value	0.370	0.364
Work Experience (years)		
1 – 5	75.5 (6.4)	11.2 (2.5)
6 – 10	76.9 (5.6)	10.7 (2.8)
11 – 15	77.9 (5.9)	10.1 (2.9)
> 15	75.0 (6.4)	9.8 (3.9)
P value	0.342	0.314
***Work setting of main job**		
In Service	76.7 (6.0)	10.7 (3.4)
Private Clinic	75.8 (6.2)	10.4 (2.5)
P value	0.915	0.005

Variables	Perception of advantages of teledentistry in improving dental practice and patient care Mean (SD)	Concerns about data security and patients' consent Mean (SD)
***Experience of teledentistry usage**		
Yes	76.6 (5.9)	10.2 (3.3)
No	76.1 (6.2)	10.7 (2.9)
P value	0.871	0.295
Range	21 – 105	5 – 25
Total	76.3 (6.1)	10.5 (3.0)

*Independent sample T-test was used

ANOVA and independent sample T-test were used to determine differences in the mean scores of perception and concerns on teledentistry for characteristics including age group, gender, working experience, qualification, work setting and experience of teledentistry usage. Overall mean score was 22.3 ± 2.4 for the capability of teledentistry to improve practice, 23.8 ± 2.6 for the usefulness of teledentistry for dental practice, 30.2 ± 2.8 for the usefulness of teledentistry for patienst and 10.5 ± 3.0 for data security and patient consent respectively. There was no statistical significant difference between respondent's sociodemographic variables like age, gender, qualification and work experience and perception about teledentistry (Table 5.3). Only work setting of respondents significantly altered their concerns about data security and patient consent (p-value = 0.005) as seen in table (5.4).

Table (5.5) Association between sociodemographic variables of the respondents and their concerns (Multiple Linear Regression)

Variables	Coefficient	95% Confidence Interval	P value
Age group (years)			
> 45 (Constant)	9.200	7.666, 10.734	
24 – 34	1.625	-0.082, 3.333	0.062
35 – 44	1.379	-0.433, 3.191	0.134
Gender			
Male (Constant)	11.145	9.402, 12.888	
Female	-0.412	-1.526, 0.702	0.465
Work setting of main job			
In service (Constant)	11.043	9.299, 12.787	
Private dental clinic	-0.343	-1.458, 0.772	0.544

Significant factors less than 0.25 were selected as the initial model for multiple linear regression following the completion of primary analysis. Comparison of mean scores with 95% CI between age groups, gender and work setting of respondents among data security and patients' consent was shown in table (5.5). Both younger age groups (24 - 34) and (35 - 44) did not show statistically significant differences compared to the reference group (>45 years). The difference in outcome between females and males was not statistically significant**.** The difference in the outcome for those working in private dental clinics was not statistically significant with those working in the public sector.

CHAPTER (6)
DISCUSSION

6.1 Sociodemographic and professional characteristics of the participants

In this study, more than half of the respondents were in the younger age group 24 – 34 years (54.3%), with slightly above half of them were female (54.31%). The similar study was conducted in Malaysia, nearly 60% of the practitioners were within the age of 25 to 34 years (Khokhar *et al*., 2022). In this study, in-person (57.8%), phone (50%) and Viber (38.8%) were the most often selected communication channels by the respondents, followed by social media (37%). Khokhar *et al.* (2022) also reported that the most popular methods of communication were in-person (48%) and phone (29%). Most of the dental practitioners in Indonesian study preferred social media as their communication tools. WhatsApp had been widely used in Indonesia. WhatsApp has also been studied as a telemedicine platform in the oral medicine (Petruzzi and Benedittis, 2016). The similar study was conducted by Australia found that dental practitioners preferred email and phone (Estai, Kruger and Tennent, 2016). In this study, the use of email by the practitioners was still limited (<20%). Many people in Myanmar may not be familiar with using email effectively and use mobile devices primarily for social media and messaging apps rather than email.

6.2 Dental practitioners' perception of the capability of teledentistry to improve practice

In this study, 42% of respondents were not sure if teledentistry would provide an accurate diagnosis in a clinical setting but 41.33 % of respondents agreed on that statement. This finding is in accordance with the findings of Mandall *et al*. (2005) where there was a great deal of doubt regarding the potential of teledentistry to assist in giving accurate diagnoses in contrast to the clinical setting. The study of Al-Khalifa and Al-Sheikh (2020) found that 38% of respondents indicated uncertainly and 32% disagreed with that statement. The Indonesian study by Soegyanto *et al*. (2022) also reported approximately one third of respondents agreed on the statement that teledentistry would provide accurate diagnosis. Similarly, only 32 % of respondents in

the study of Khokhar *et al.* (2022) agreed that statement and 42% had doubts in diagnostic accuracy of teledentistry. However, the study of Estai, Kruger and Tennent (2016) revealed a promising diagnostic accuracy of teledentistry when diagnosing caries or oral pathology cases. Increased diagnostic accuracy of teledentistry was achieved after proper training, where training sessions were conducted for practicing dentists. Therefore, if teledentistry is well trained and follows a predetermined protocol, it can generate an acceptable diagnosis.

Over three-quarters of the respondents (78.45%) agreed with the statement that teledentistry would help reduce the waiting list. Similar finding was reported in the Malaysian study by Khokhar *et al*. (2022) in which 77% of the respondents agreed that statement. Soegyanto *et al*. (2022) also observed that the majority of Indonesian dental practitioners believed teledentistry would be effective in reducing the waiting list. In this study, 75.8% of respondents agreed that teledentistry would enhance guidelines and advice. It corresponded with findings of Al-Khalifa and Al-Sheikh (2020) and Soegyanto *et al*. (2022) where 76% and 79.6% of respondents believed that teledentistry improved guidelines and advice respectively. Teledental platform facilitates knowledge-sharing through webinars, case discussions, and virtual training.

Majority of the respondents (77.6%) agreed and strongly agreed that teledentistry would assist in more efficient referrals. Similar findings were observed in a previous study of Saudi Arabia in 2020, in which 73% of respondents were in agreement Al-Khalifa and Al-Sheikh, 2020. This similarity might be due to the effect of teledentistry on the referral process. This indicates the patients will ideally be referred to a specialty clinic after considering their individual needs and conditions and making an informed decision. Patient management and referral process are some of the main drivers to implement teledentistry in dental practice. The majority of respondents (83.6%) agreed that teledentistry would improve communication with professionals, which was similar to previous report by Soegyanto *et al*. (2022) where 81.9% showed agreement. In contrast, only 58% of respondents showed positive perception to that statement in the study of Khonkhar *et al*. (2022). By applying teledentistry, dentists in remote or underserved areas can seek guidance from specialists, improving the quality of care and fostering professional relationships, overcoming geographical barriers and saving time.

Overall, a significant proportion of the respondents felt that teledentistry was useful for the practice of dentistry. In addition, the majority of participants accepted that teledentistry would assist in reducing waiting lists, a benefit that can be attributed to the efficient referral technique via teledentistry. Another important advantage of teledentistry that got highlighted was improvement in guidelines and peer communication.

6.3 Dental practitioners' perception of teledentistry usefulness for the dental practice

In this study, 66.4% of the participants believed that teledentistry would be beneficial to dental practice by enhancing continuing education and clinical training. This agreement was scored less than the previous study (Estai, Kruger and Tennent 2016), in which more than 90% of participants said that teledentistry would improve dental practice by enhancing continuing education. However, the percentage of respondents in agreement with this statement of the current study is still higher than the Malaysian study where only 52% expressed agreement and Indonesian study where 56.9% of participants were in agreement to that statement. Almost 40% of the participants agreed with teledentistry increasing treatment time spent with the patient, but 37% were not convinced about that statement. This result was similar to a previous study done by Soegyanto *et al* in 2022, where 40% of participants agreed and 34.4% were not sure about this. Almost the same findings were reported by Khokhar *et al.* (2022) in which 42% were in agreement and 35 % were neutral about this statement.

Nearly half of the respondents (47%) felt that teledentistry would require extra appointments for photography. It was similar to study done by Al-Khalifa and Al-Sheikh in 2020 in which above half of the respondents indicated that teledentistry would necessitate an extra appointment to take photographs. In the same study in Malaysia in 2022, almost 65% of respondents said that a follow-up appointment would be required for photography (Khokhar *et al*., 2022). This highlights the awareness that appropriate photos taken by trained experts are essential. This requirement can also be reduced if the dental practitioners participate in appropriate intraoral photography training courses. The majority of respondents (78.4%) indicated that teledentistry could be quite useful in improving dental practice by saving time when compared to conventional referral, which was undoubtedly similar to previous

literatures. But in an Australian study, about 70% of respondents were not convinced about that statement (Estai, Kruger and Tennent, 2016).

Almost half of the respondents (48.3%) were not sure if teledentistry would be too expensive to set up. Findings in this study are also comparable to other international studies. Research in Indonesia (Soegyanto *et al*., 2022) showed that 47.1% of respondents were not certain of this statement. Ideal setting for teledentistry should have appropriate and adequate technology that allows download, storage and transfer of large files as well as support audiovisual functions to enable live videoconferencing. This might need higher quality computer systems, intraoral cameras, intraoral scanners, digital radiography, 3D cone beam computed tomography. However, depending on the financial condition of the area, basic form of teledentistry only using mobile phone and internet service can be used as an initial set-up to allow exchange of clinical information, distant consultation of specialists and distant planning of appropriate treatments. Although 40% of respondents agreed that teledentistry would provide adequate diagnostic information, above one-third of respondents were not sure. Similar to some previous studies, there was considerable doubt regarding teledentistry being able to provide accurate diagnosis as compared to in-person consultancy. Concern over diagnostic validity has been addressed in the Mandall *et al*. 2005.

In several areas of dentistry, teledentistry has been used to screen for dental caries and periodontal diseases. However, in some areas of dentistry, the uncertainty of diagnostic accuracy may be related to the inability to perform clinical examinations other than visualization to establish an accurate diagnosis. Some of the studies though depicted a high level of diagnostic accuracy with oral pathologies or dental caries (Senneby *et al*., 2015; Estai *et al.,* 2018). Teledentistry has been utilized to screen for periodontal diseases and tooth decay in several areas of dentistry. This was the outcome of appropriate training; dental practitioner conducted the sessions to ensure accurate diagnosis. Oral lesions vary in color, shape and consistency. Therefore, a very high quality of oral images is important to allow for online consultation. If proper training is given according to a set protocol, teledentistry can deliver an acceptable diagnosis.

The majority of respondents believed that teledentistry would enhance dental practice in a number of ways. They expressed strong agreement about the benefits that teledentistry will provide to the dental practice. Clinical training and ongoing education will be improved via teledentistry, which also saves time compared

to traditional referral methods and reduces costs for dental practice. Dental practitioners will be able to improve their skills and knowledge by using distance learning. Effective time management and cost savings can draw in patients and ensure their trust. Moreover, tele-consultations were less expensive than common in-person consultations. In general, this study expressed that Myanmar dental practitioners had a positive perception about the usefulness of teledentistry to improve practice and benefit patients.

6.4 Dental practitoners' perception of the usefulness of teledentistry for patients

In present study, more than half of respondents (57.8%) agreed and strongly agreed that teledentistry would save money for patients. Saving money is another factor that can attract patients. The majority of respondents showed that teledentistry would be helpful for patient education. Khokhar *et al*., 2022 also agreed on the fact that teledentistry would be of great assistance in health education for patients. The most of the respondents (84.5%) were in agreement that teledentistry would be helpful in monitoring the patient's condition and that it would improve communication with patients. Soegyanto *et al*., 2022 also believed teledentistry could be useful in monitoring and educating patients. In addition, respondents were more willing to interact with their patients and professionals. This was reflected in their support of the concept that teledentistry would enhance communication, clinical training and guidance among practitioners, and improve relationship with patients.

Most of the respondents (86%) in this study mentioned that teledentistry would be beneficial for patients residing in rural or remote locations by avoiding unnecessary travel to dental clinic, which is similar to previous literature. Nearly 100% of respondents in the Australian study (Estai, Kruger and Tennent, 2016) agreed with this assertion. About 60% agreed that teledentistry can be convenient and well received by the patients. More than half of the respondents showed a positive perception that teledentistry should be covered by dental insurance plans, but 47 (40.5%) were not sure about that statement. In the Malaysian study, Khokhar *et al*., 2022, the majority of the respondents (70%) agreed and strongly agreed that dental insurance plans should cover teledentistry cost, which can be another factor that attracts patients. Many countries have adopted teleconsultation and telecommunication into their health insurance plans (Keizer *et al.,* 2018).

Overall, the findings are consistent with the usefulness of teledentistry for patients and dental practices. Similar results were found in other published research on the perceptions of dental practitioners' about teledentistry in other nations, where most dental practitioners mentioned the benefits of teledentistry for patients and the practice effectively. Although this study differed slightly from previous studies, the variation might be due to the respondents' other concerns regarding benefits for the patients. Generally, the findings of this study indicated the advantages of teledentistry for both the dental practice and patiensts. The majority of respondents in other published research agreed that teledentistry has benefits particularly for patients and the dental practice.

6.5 Dental practitioners's concerns about data security and patients' consent

Concerns regarding patient confidentiality were the most common (80.7%), as patients and practitioners are always concerned about who can access or view their health information when it is shared online. This concern is in agreement with previous findings by Al-Khalifa and Al-Sheikh (2020). These aspects of concern were actually similar to previous studies conducted in Australia, Malaysia and Indonesia although quite different from studies in the UK and Canada (Mandall *et al*., 2005; Palmer *et al*., 2005; Estai, Kruger and Tennent, 2016; Khokhar *et al*., 2022; Soegyanto *et al*., 2022) that indicated the security issues were not important. This result suggested that if dental practitioners practice teledentistry, they should invest maximum efforts to protect the confidentiality of patient information. The teledentistry system should store securely patient's information in an electronic format. Protection of teledentistry platforms such as email, social media, phones and other unique teledentistry systems is of critical importance. Data encryption, user name and passwords systems and use of server authentications and digital signatures should be adopted. Concentrating on data confidentiality so that unauthorized person cannot access the clinical data, the identity of source and destination of the messages should be ensured.

In this study, respondents also expressed high concerns relating to reliability of teledental equipment (68%), digital forgery (71.5%) and patient consent (67.3%). These concerns were actually comparable to earlier research conducted in Malaysia Saudi Arabia and Australia (Estai, Kruger and Tennent, 2016; Al-Khalifa and

Al-Sheikh, 2020; Khokhar *et al*., 2022). All dental professionals involved in the teledentistry method must familiarize themselves with the teledental equipment and technologies to optimize the benefits of the teledentistry. Concerns about hardware and software incompatibility (60.3%) scored less than other concerns. Findings of this study were consistent with concerns expressed by Mandall in 2004. To have the latest tele-technology is not sufficient without the proper design of infrastructure. To fix this issue, the installation of compatible hardware and software is required to ensure completely secure interaction between technical components. An appropriate infrastructure will not only prevent the technical errors in digital systems but will also reduce costs.

6.6 Dental practitioners' opinion regarding the preferred dental specialties for application of teledentistry

In the last section, the participants were questioned about their preferred dental specialties for the use of teledentistry. In Myanmar, there are eight recognized dental specialties; namely Oral and Maxillofacial Surgery, Oral Medicine, Pedodontics, Orthodontics, Periodontology, Community Dentistry, Conservative dentistry and Prosthodontics. Although respondents in this study believed that teledentistry may be used in a variety of dental specialties, oral medicine and community dentistry were the two specialties that had the highest agreement about the application of teledentistry by the respondents, which was similar to the previous study done by Soegyanto in 2022. This reflects the feasibility of teledentistry method in health education to reduce burden of oral diseases. Moreover, detection of early childhood caries in preschool children using teledentistry has been proven to be efficient. In Saudi Arabia study in, most of the participants recommended the use of teledentistry in the specialty of oral medicine (Al-Khalifa and Al-Sheikh, 2020). Numerous studies have been carried out to examine the efficacy of teledentistry, particularly community dental screening (Estai *et al*., 2018). Several studies conducted in many countries have endorsed the use of teledental care in oral medicine (Bradley *et al*., 2010; Petruzzi and Benedittis, 2016). Some oral precancerous lesions can be diagnosed early with teledentistry, improving the prognosis and preventing complications. Remote diagnosis and management of patients with oral lesions by oral medicine specialists through teledentistry has proven to be efficient in identifying various oral lesion. Teledentistry-assisted distant diagnosis of digital images

of oral precancerous lesion and management is an effective alternative in early prevention of oral cancer.

In this study, oral surgery scored less than 30% of the response, which is similar to the Indonesian study where the specialty least preferred to be applied in teledentistry was oral surgery (Soegyanto *et al*., 2022). However, studies highlighted application of teledentistry in oral surgery is an efficient and cost-effective method to provide pre-operative evaluation in situations in which patient transport is difficult or costly (Jampani *et al*., 2011). Orthodontics also scored less than 30% in this study, which is in accordance with the findings of Soegyanto *et al*. (2022) and Khokhar *et al*. (2022). In contrast, 71% of dental practitioners thought teledentistry for orthodontic referrals would be a good idea (Mandall *et al*., 2005). Interceptive orthodontic treatments provided by well-trained general dentists and guided remotely by orthodontic specialists using teledentistry have been suggested as a practical way to reduce the severity of malocclusions in children when referral to an orthodontist is not possible. Prosthodontics was the least scoring dental specialty for application of teledentistry for Myanmar dental practitioners in the current study. It might be due to the fact that most prosthodontics procedures had to be performed in person. However, teledentistry using synchronous collaborating platforms served in prosthodontics for diagnosis and treatment-planning for patients who required oral rehabilitation (Maqsood *et al*., 2021).

6.7 Association between respondents' sociodemographic and professional characteristics with their perception and concerns on teledentistry

In this study, most of the sociodemographic factors except their current work setting of respondents did not influence their perception about teledentistry. In the domain of data security and patients' consent, a statistically significant difference was found between respondents' work settings, where the dental practitioner who worked in private clinics scored less than those who worked in the government sector ($p = 0.005$). In contrast, previous study had shown that dental practitioners who worked in private clinics are more accepting of the teledentistry and its benefits (Al-Khalifa and Al-Sheikh, 2020). This Saudi Arabia study also showed that the participants' qualifications and working experience were significantly affecting this study's results.

In Indonesian study, working experience of the dental practitioners significantly altered their perception that teledentistry was useful for patients (Soegyanto *et al*., 2022).

The findings of this study were largely comparable to those of a similar study conducted in Saudi Arabia. Both studies reported identical mean scores (22.3) for the capability of teledentistry to improve practice. While perceptions of the usefulness of teledentistry for dental practice were slightly higher in this study (23.8), perceptions of the usefulness of teledentistry for patients were consistent between two studies (30.2 and 30.5), indicating that dental practitioners felt teledentistry was beneficial for patients. However, in the domain of data security and patients' consent, scores in both studies were relatively low. This highlighted the need for better approaches to address privacy and consent issues.

By applying the independent sample T-test, respondents' work setting showed a statistically significant difference with concerns about data security and patients' consent ($p = 0.005$). However, when a multiple linear regression analysis was performed, this association was no longer statistically significant. This suggested that the initial association observed in the primary analysis may have been influenced by other sociodemographic factors, rather than being an independent effect of work setting.

Limitation of the study

This study may have some limitations. Even though multiple reminders were sent to call for participation, not all invited participants completed this survey. This study included only dental practitioners from a Facebook group, which may result in selection bias and cannot be generalized to all dental practitioners in Myanmar. However, this study collected responses from dental practitioners in nine different regions of Myanmar, showing that the perception of teledentistry is consistent across different areas.

CHAPTER (7)
CONCLUSION

A cross-sectional descriptive study was conducted among currently practicing Myanmar dental practitioners to determine their perception and concern about teledentistry usage. A total of 116 dental practitioners completed this electronic survey using a validated questionnaire. Most of the participants expressed positive perception on the capability and usefulness of teledentistry to improve dental practice. The majority of the study population accepted that teledentistry is beneficial to dental practice by reducing waiting lists, enhancing treatment guidelines, providing better referral systems. Moreover, the majority of respondents believed that teledentistry can improve inter-professional communications, providing collaborative work in distant diagnosis and management of oral diseases. In addition, over half of the respondents thought that teledentistry would enhance continuing dental education and clinical training. On the contrary, some doubts about teledentistry such as diagnostic accuracy, necessity of extra appointment for photo taking and expenses for the initial set up were expressed. Most of the participants believed that teledentistry had advantages for the patients as it was useful for patient monitoring, patient education and promoted communication between oral health care providers and patients. Furthermore, the respondents thought that teledentistry would be beneficial for patients in rural and remote areas by avoiding unnecessary travel. Oral medicine and community dentistry were the two specialties most preferred for the application of teledentistry. Despite optimism on the benefits of teledentistry, the participants expressed their concerns about the practice of teledentistry. The most common concern was the confidentiality of patients' data and digital forgery. If these concerns can be overcome by formulating well-defined protocols and security measures, teledentistry might be integrated into the current oral health care system to make oral health care services available to many people residing in underserved areas. Statistically significant difference wasn't found between the sociodemographic characteristics of the respondents and their perceptions and concerns regarding teledentistry.

CHAPTER (8)

RECOMMENDATIONS

Based on results of this study, the following recommendations are proposed to overcome the concerns related to teledentistry usage and to make it more applicable in daily dental practice.

(1) The infrastructure for initial installation of teledental equipment at the public dental health centers should be inlcluded in the future oral health care plans.

(2) Training programs of teledentistry for all dental professionals including dental specialists and oral health care personnels should be conducted.

(3) As good quality images can escalate diagnostic accuracy of teledentistry, training for intraoral photography should be conducted before the application of teledentistry.

(4) Teledentistry platforms and equipment must be protected in order to address concerns regarding digital forgeries and patients' data confidentiality when shared online.

(5) By using teledentistry, specialist dental care can be provided to patients residing in remote areas. Therefore, it should be integrated into current oral health care planning to narrow the gap in availability of oral health services between rural and urban areas.

REFERENCES

Al-Khalifa KS and AlSheikh R (2020). 'Teledentistry awareness among dental professionals in Saudi Arabia'. *Plos One* 15(10):e0240825. Available at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC7561132> [Accessed: 29 March 2024].

Alotaibi, S. and Alshehri, A. (2022). 'Teledentistry Approaches for Dental Assessments and Consultation During the COVID-19 Pandemic'. *Smart Homecare Technology and TeleHealth*, 9, pp.11-25.

Alshammari, A. and Almaktoom, I. (2023) 'Teledentistry Awareness and Knowledge Among Dental Practitioners and Patients in Jeddah, Saudi Arabia'. *Dove Press.* Available at: <https://www.dovepress.com/teledentistry-awareness-and-knowledge-among-dental-practitioners-and-p-peer-reviewed-fulltext-article-CCIDE> [Accessed: 12 July 2024].

Alsharif, A., Felemban, D., Bakeer, H. and Kassim, S. (2024) 'Validity and reliability of a teledentistry survey among dental practitioners in Saudi Arabia' *PeerJ.* Availabel at: < https://pubmed.ncbi.nlm.nih.gov/38313015> [Accessed: 12 July 2024].

American Teledentistry Association (2021) Facts about Teledentistry. Available at: https://www.americanteledentistry.org/facts-about- teledentistry/ [Accessed: 30 March 2024]

Balsaraf, S.V. and Chloe, R.H. (2015) 'Knowledge, awareness, and attitude among practicing dentists about teledentistry in Indore, Central India'. *Journal of Indian Association of Public Health Dentistry*. Available at: <https://www.jiaphd.org/article.asp?issn=23195932;year=2015;volume=13;issue=4;spage=434;epage=437;aulast=Balsaraf> [Accessed: 29 March 2024].

Bhambal, A., Saxena, S. and Balsaraf, S.V. (2010) 'Teledentistry: potentials unexplored' *Journal of International Oral Health*. Available at <https://www.ispcd.org/userfiles/rishabh/jioh-02-03-01.pdf> [Accessed: 29 March 2024].

Bowen, T.B., Rinchuse ,D.J., Zullo, T. and DeMaria, M.E. (2015) 'The influence of text messaging on oral hygiene effectiveness', *Angle Orthod*, 85(4), pp.543-548.

Bradle, M., Black, P., Noble, S., Thompson, R. and Lamey, P.J. (2010) 'Application of teledentistry in oral medicine in a community dental service', *N. Ireland. Br Dent J*, 209(8):399–404.

Chaudhary, F.A., Ahmad, B., Javed, M.O, Mustafa, S., Fazal, A., Javaid, M.M., Siddiqui, A.A., Alam, M.K. and Din, S.U. (2022) 'Teledentistry awareness, its usefulness, and challenges among dental professionals in Pakistan and Saudi Arabia'. *Sage.* Available at:<https://journals.sagepub.com/doi/full/10.1177>[Accessed: 10 October 2024].

Chen, J.W., Hobdell, M.H., Dunn, K., Johnson, K.A. and Zhang, J. (2003) 'Teledentistry and its use in dental education'. *J Am Dent Assoc,* 134(3),pp.342-346.

Cheuk, R., Adeniyi, A.A., Farmer, J. and Singhal, S. 'Teledentistry use during the COVID-19 pandemic: perceptions and practices of Ontario dentists', *BMC Oral Health.* Available at <https://www.researchgate.net/publication/368281975> [Accessed: 29 March 2024].

Chhabra, N., Chhabra, A., Jain, R.L., Kaur, H. and Bansal, S. (2011) 'Role of Teledentistry in Dental Education: Need of the Era', *Journal of Clinical and Diagnostic Research*, 5(7), pp. 1486-1488.

Estai, M., Kanagasingam, Y., Tennant, M. and Bunt, S. (2018) 'A systematic review of the research evidence for the benefits of teledentistry', *J Telemed Telecare*, 24(3):147–56.

Estai, M., Kruger, E. and Tennant, M. (2016) Perceptions of Australian dental practitioners about using telemedicine in dental practice', *British Dental Journal*, 220, pp.25-29.

Heale, R. 'Communication technology and healthcare', *Evid Based Nurs*, 21(2), pp.36-37.

Flores-Mir C., Palmer, N.G., Northcott, H.C., Khurshed, F. and Major, P.W. (2006), 'Perceptions and attitudes of Canadian dentists toward digital and electronic technologies' *J Can Dent Assoc*. 2006 Apr;72(3), p.243.

Howell, S.E.I. and Fukuoka, B. (2022) 'Teledentistry for Patient-centered Screening and Assessment', *Dental Clinics of North America*, 66(2), pp. 195–208.

Hung, M., Lipsky, M.S., Phuatrakoon, T.N., Nguyen, M., Licari, F.W. and Unni, E.J. (2022) 'Teledentistry Implementation During the COVID-19 Pandemic: Scoping Review', *Interactive Journal of Medical Research*. Available at: <https://doi.org/10.2196/39955> [Accessed: 10 October 2024].

Irving, M., Stewart, R., Spallek, H. and Blinkhorn, A. (2018) 'Using teledentistry in clinical practice as an enabler to improve access to clinical care: A qualitative systematic review'. Available at: <https://journals.sagepub.com/doi/abs/10.1177/1357633X16686776> [Accessed: 9 October 2024].

Islam, M.R.R., Islam, R., Ferdous, S., Watanabe, C., Yamauti, M., Alam, M.K. and Sano, H. (2022) 'Teledentistry as an Effective Tool for the Communication Improvement between Dentists and Patients: An Overview', *Healthcare*. Available at: <https://www.mdpi.com/2227-9032/10/8/1586> [Accessed: 10 October 2024].

Jampani, N.D., Nutalapati, R., Dontula, B.S. and Boyapati, R. (2011) 'Applications of teledentistry: A literature review and update', *J Int Soc Prev Community Dent*, 1(2), pp.37-44.

Kanani, H., Khubchandani, M., Dangore-Khasbage, S. and Pandey, R. (2024) 'Teledentistry: A Comprehensive Review and Its Application in Pediatric Dental Care', *Cureus*. Available at <doi: 10.7759/cureus.52685. PMID: 38384649; PMCID: PMC10880874> [Accessed: 2 October 2024].

Keizer, E., Huibers, L., Christensen, M.B. and Senn, O. (2018) 'Impact of alternative healthcare plans on out-of-hours help- seeking intentions in Switzerland', *Swiss Medical Weekly*, 22 (148) pp.146-48.

Khokhar, R.A., Ismail, W.A., Sunny, A., Shaikh, G.M., Ghous, S., Ansari, M., Zia, S.H., Arshad, S. and Alam, M.K. (2022) 'Awareness regarding Teledentistry among Dental

Professionals in Malaysia', *BioMed Research International*. Available at: <https://doi.org/10.1155/2022/3750556> [Accessed: 2 October 2024].

Kumar, N., John, N., Devi, N. and Vivek, S. (2019) 'Teledentistry: An Overview', *Journal of Clinical Research in Dentistry*, 2(2), pp.1-2.

Lachenbruch, P.A., Lwanga, S.K. and Lemeshow, S. (1991) 'Sample Size Determination in Health Studies: A Practical Manual', *Journal of the American Statistical Association,* 86(416), p. 1149.
Available at: <https://doi.org/10.2307/2290547> [Accessed: 10 October 2024].

Mandall, N., O'Brien, K., Brady, J., Worthington, H. and Harvey, L. (2005) 'Teledentistry for screening new patient orthodontic referrals. Part 1: A randomised controlled trial', *British dental journal*, 199(10), pp. 659-62

Maqsood, A., Sadiq, M.S.K, Mirza, D., Ahmed, N., Lal, A., Alam, M.K. and Halim, M.S.B. (2021) 'The Teledentistry, Impact, Current Trends, and Application in Dentistry: A Global Study'. *BioMed Research International*. Available at: <https://onlinelibrary.wiley.com/doi/full/10.1155/2021/5437237> [Accessed: 10 October 2024].

Ozveren, N., Yuksel, B., Gungor, A.S. and Baltaci, E. (2023) 'Evaluation of Knowledge and Awareness about Teledentistry among Dentists and Patients Living in Turkey', *Dental and Medical Problems*. Available at <https://www.researchgate.net/publication/362761330> [Accessed: 3 September 2024].

Palmer, N.G., Yacyshyn, J.R., Northcott, H.C., Nebbe, B. and Major, P.W. (2005), 'Perceptions and attitudes of Canadian orthodontists regarding digital and electronic technology' *Am J Orthod Dentofacial Orthop*. 2005 Aug;128(2), pp. 163-7

Petruzzi, M. and Benedittis, D.M. (2016), 'WhatsApp: a telemedicine platform for facilitating remote oral medicine consultation and improving clinical examinations' *Oral Surg Oral Med Oral Pathol Oral Radiol*, 121(3), pp.248–54.

Raja, K.P., Pal, A., Nayak, S.U., Pai, K. and Shenoy, R. (2022) 'Teledentistry: a new oral care delivery tool among Indian dental professionals - a questionnaire study',

F1000 Research. Availabel at <https://pubmed.ncbi.nlm.nih.gov/36249998> [Accessed: 3 September 2024].

Raucci-Neto, W., de Souza Pereira, M., Cerqueira, N.M., Louzada, V.G., de Castro Raucci, L.M.S. and Leoni, G.B. (2022) 'Knowledge, Perception, and Experience of Dentists About Teledentistry', *International Dental Journal*, 72(4), pp.456-462.

Rossomando, E.F. (2024) 'The national crisis in access to oral health care: a dental industry association responds', *Compend Contin Educ Dent*, 25(4), pp.266-270.

Scheerman, J.F.M., Qari, A.H., Varenne, B., Bijwaard, H., Swinckels, L., Giraudeau, N., van-Meijel, B. and Mariño, R. (2024) 'A Systematic Umbrella Review of the Effects of Teledentistry on Costs and Oral-Health Outcomes', *Int J Environ Res Public Health*, 21(4), p.407.

Sede, M.A., Ehizele, A.O. and Chukwumah, N.M. (2024) 'The Use of Teledentistry for Patient Care among Dentists in Nigeria', *Nigerian Journal of Dental Researc*h, 9(1), pp. 11-21.

Senneby, A., Mejare, I., Sahlin, N.E., Svensater, G. and Rohlin, M. (2015) 'Diagnostic accuracy of different caries risk assessment methods. A systematic review', *J Dent*. 43(12), pp.1385–93.

Soegyanto, A.I., Wimardhani, Y.S., Maharani, D.A. and Tennant, M. (2022) 'Indonesian Dentists' Perception of the Use of Teledentistry', I*nternational Dental Journal*, 72(5), pp.674-681.

Srivastava, R. (2023) 'Teledentistry: Transforming Dental Care Delivery and Education in the Digital Age', *IOSR Journal of Dental and Medical Sciences*. Available at: <https://doi.org/10.35629/5252-0503581586> [Accessed: 3 September 2024].

Tella, A.J., Olanloye, O.M. and Ibiyemi, O. 'Potential of Teledentistry in the delivery of Oral Health Services in Developing Countries', *Annals of Ibadan Postgraduate Medicine*, 17(2), pp. 115-123.

Tin-Htet-Oo, Tianviwat, S. and Thitasomakul, S. (2021) 'Oral Health System in Myanmar: A Review', *Journal of International Society of Preventive and Community Dentistry*, 11(3),pp.231-241.

Tiwari, T., Diep, V., Tranby, E., Thakkar-Samtani, M. and Frantsve-Hawley, J. (2022). 'Dentist perceptions about the value of teledentistry', *BMC Oral Health.* Available at: <https://link.springer.com/article/10.1186/s12903-022-02208-z> [Accessed: 10 October 2024].

Wheeler, T. (1999) 'Smile for the camera: telemedicine comes to your local dentist's office', *Telemedicine Today*, 7(1), pp. 14-15.

Zaw-Moe-Thein, Su-Kyaw-Myint, Naw-Hnin-Zar-Phyu, Aye-Mya-Yadana, Khin-Mya-Tun and Shwe-Toe. (2020) 'Myanmar Dental Students' Knowledge and Attitudes Towards Teledentistry', *Myanmar Health Sciences Research Journal*, 32(1), pp.1-6.

Estai, M., Kanagasingam, Y., Tennant, M. and Bunt, S. (2018) 'A systematic review of the research evidence for the benefits of teledentistry', *J Telemed Telecare*, 24(3):147–56.

ANNEXES

Annex (1) Operational Definitions of Variables

No.	Variables	Operational definition	Scale of measurement
1	Age	Age at last birthday (complete years of age)	Ratio
2	Gender	Biological difference between male and female	Nominal
3	Qualification	Educational attainment of respondent (completed level) and categorized as Bachelor Master Doctorate	Ordinal
4	Work setting	Currently practicing area, categorized as In service Private dental clinic	Nominal
5	Work experience	The years of working as a dental practitioner (completed)	Ratio
6	Working hour	Period of time that an individual is expected to be actively engaged in their job duties	Ratio
7	Perception on teledentistry	Individuals' understanding, opinions, and attitudes about its usefulness, challenges, and impact on dental care. Categorized as three domains: The capability of the teledentistry to improve practice The usefulness of the teledentistry for dental practice The usefulness of the teledentistry for patients	Ratio

No.	Variables	Operational definition	Scale of measurement
8	Concerns on teledentistry	Concerns on teledentistry focus on data security, patient consent, technical challenges, costs, quality of care, and acceptance by users.	Ratio
9	State and Region	Categorized as Nay Pyi Taw Yangon Mandalay Bago Ayeyarwady Magway Sagaing Tanintharyi Chin Kachin Kayah Kayin Mon Rakhine Shan	Nominal

Annex (2) Informed consent form (English and Myanmar)

Informed consent form (English)

Institutional Review Board
University of Public Health, Yangon
Ministry of Health
Republic of the Union of Myanmar
Informed Consent Form

This informed consent form is for dental practioners, whom I am inviting to participate in research, titled "Perception and concerns of Myanmar Dental Practitioners towards Teledentistry".

Name of Principal Investigator: Dr. Ye Myint Aung (MPH-5)

Name of Organization: University of Public Health, Yangon

Title of the Study: "Perception and concerns of Myanmar Dental Practitioners towards Teledentistry"

PART I: Information Sheet

1. Introduction

I am Dr. Ye Myint Aung, Candidate of Master of Public Health (MPH) (1/2024) course, at University of Public Health, Yangon. I am doing research on "Perception and concerns of Myanmar dental practitioners towards teledentistry". I would like to give you information and invite you to be part of this research. Before you decide to participate, you can talk to anyone you feel comfortable with about the research. This consent form may contain words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them of me or of another researcher.

2. Purpose of the research

Teledentistry is a form of telehealth, using electronic information, imaging and communication technologies. Purpose of this study is to get information about perception and concerns of Myanmar dental practitioners towards teledentistry.

3. Type of Research Intervention

This research will include your participation with self-administrative questionnaire using electronic based survey.

4. Participant selection

You are being invited to take part in this research because you are dental practitioner and we believe that your opinion about teledentistry will contribute to implementation of better dental healthcare delivery in Myanmar.

5. Voluntary Participation

Your participation in this research is entirely voluntary. It is your choice whether to participate or not. You can withdraw from this research if you change your mind later.

6. Procedures and Protocol

You will be asked to take part in an electronic survey using self-administered questionnaire which will take about 20 minutes. This questionnaries will include your socio-demgraphic information and your perceptives on using teledentistry. The information recorded will be kept confidential and no one else except me will have acess to this information.

7. Duration

It will take about 20 minutes for answering.

8. Risks and discomfort

There is a risk that you may share some personal or confidential information by chance, or that you may feel uncomfortable talking about some of the topics. However, we will not let this to happen. You do not have to answer any question if you feel the question(s) are too personal or if talking about them makes you uncomfortable.

9. Benefits

There will be no direct benefit to you, but your participation will help us observe more about Myanmar dental practitioners' perception and concerns about teledentisty thus how to achieve better implementation of teledentistry in future.

10. Incentives

By participating in this study, you will not be provided any incentive.

11. Confidentiality

I will not be sharing information about your participation in this study to anyone outside of research team. The collected information from this research will be kept confidential.

12. Sharing the Results

The knowledge that we get from this research will be shared with only to the persons who have the responsibility for this study. We will publish the results to be read only by the professionals of interest or implementers or policy makers who are able to learn and apply as necessary. Anyhow, the confidential information will not be shared.

13. Right to Refuse or Withdraw

You do not have to take part in this research if you do not wish to do. You may stop participating in the research at any time.

14. Who to Contact

If you have any questions, you can ask them now or later. If you wish to ask questions later, you may contact the principal investigator Dr.Ye Myint Aung, phone; +959443002517 or viber: +9595157789 or via email ymathedentist@gmail.com. This proposal has been reviewed and approved by Institutional Review Board, University of Public Health, which is a committee whose task is to make sure that research participants are protected from harm. If you wish to find out more about UPH-IRB, contact the secretary of UPH-IRB at University of Public Health, Yangon, No 246, Myoma Kyaung Street, Latha Township, Yangon, 11131. Office Phone +95 18395213, +9518395214 ext: 20/26.

PART II: Certificate of Consent

I have been invited to participate in research about "Perception and concerns of Myanmar dental practitioners towards teledentistry". I have been well informed about the study and I understand that there will be no personal benefit for me. I have been given name and contact information of researcher. I understand that I will have to answer electronic-based questionnaires which include my background characteristics as well as professional characteristics, and perspectives on using teledentistry at dental clinic. I have had the opportunity to ask any question about the research and I have right to withdraw from the study at any time. I have read foregoing information and I consent voluntarily to take part in this study.

Name of Participant: ----------

Signature of Participant: ----------

Date (Day/month/year): ----------

Name of Researcher: ----------

Signature of Researcher: ----------

Date (Day/month/year): ----------

This Informed Consent Form has been provided to participant by using Kobo collet platform.

Informed consent form (Myanmar)

သုတေသနကျင့်ဝတ်နှင့် ကျွမ်းကျင်မှုပိုင်းဆိုင်ရာ ဆန်းစစ်သုံးသပ်ရေးဘုတ်အဖွဲ့

ပြည်သူ့ကျန်းမာရေး တက္ကသိုလ် (ရန်ကုန်)

ကျန်းမာရေးဝန်ကြီးဌာန

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်

သုတေသန သဘောတူညီချက်ပုံစံ

ဤသဘောတူခွင့်ပြုလွှာသည် မြန်မာ သွားနှင့်ခံတွင်း ဆရာဝန်များ၏ တယ်လီသွား ကျန်းမာရေး စနစ်အပေါ် ထင်မြင်ယူဆချက် အမည်ဖြင့် ပြုလုပ်မည့် သုတေသနတွင် ပါဝင်ရန် သွား နှင့် ခံတွင်း ဆရာဝန်များအား ဖိတ်ခေါ် ခြင်း ဖြစ်ပါသည်။

သုတေသီအမည် - ဒေါက်တာရဲမြင့်အောင်

အဖွဲ့အစည်းအမည် - ပြည်သူ့ကျန်းမာရေးတက္ကသိုလ်၊ ရန်ကုန်။

သုတေသနခေါင်းစဉ် - မြန်မာ သွားနှင့်ခံတွင်း ဆရာဝန် များ၏တယ်လီ သွားကျန်းမာရေး စနစ် အပေါ် ထင်မြင် ယူဆချက် ကို လေ့လာသောသုတေသန။

အပိုင်း (၁) သုတေသန နှင့် စပ်လျဉ်းသည့် အကြောင်းအရာများ

၁။ သုတေသန မိတ်ဆက်

ကျွန်တော်သည်ပြည်သူ့ကျန်းမာရေးတက္ကသိုလ်မှပြည်သူ့ကျန်းမာရေး မဟာ ဘွဲ့ လွန် သင်တန်း တက်ရောက်နေသော ဒေါက်တာ ရဲမြင့်အောင် ဖြစ်ပါသည်။ ကျွန်ုပ်သည် 'မြန်မာ သွားနှင့်ခံတွင်း ဆရာဝန်များ၏ တယ်လီသွားကျန်းမာရေး စနစ်အပေါ် ထင်မြင်ယူဆချက်' အမည်ဖြင့် သုတေသန လုပ်ဆောင်နေပါသည်။ သုတေသန တွင် ပါဝင်ရန်သင့်ကို ဖိတ်ခေါ်အပ်ပါသည်။ ဤ သဘောတူလက်မှတ် ပုံစံတွင် သင် မသိ နားမလည်သော စကားလုံးများ

ပါဝင်နိုင်ပါသည်။ နားမလည်သည့် အချက်များ ရှိပါက ကျွန်ုပ်အား မေးမြန်းနိုင်ပါသည်။ နောက်ပိုင်းတွင်လည်း မေးခွန်းရှိပါက ကျွန်ုပ်ကို တတ်နိုင်သမျှ မေးမြန်းနိုင်ပါသည်။

၂။ သုတေသန၏ ရည်ရွယ်ချက်

ဤ သုတေသန၏ ရည်ရွယ်ချက်မှာ မြန်မာနိုင်ငံရှိ သွားနှင့် ခံတွင်း ဆရာဝန်များ၏ တယ်လီသွားကျန်းမာရေး စနစ်အပေါ် ထင်မြင်ယူဆချက် နှင့် ပတ်သက်သည့် သတင်း အချက်အလက်များ ရရှိရန် ဖြစ်ပါသည်။

၃။ သုတေသနဆောင်ရွက်ပုံအမျိုးအစား

ဤသုတေသနတွင် သင်၏ ပါဝင်မှုမှာ အီလက်ထရွန်နစ် မီဒီယာသုံး စစ်တမ်း ဖြေဆိုခြင်းဖြင့် ကိုယ်တိုင်ဖြေကြားရမည့် စစ်တမ်း ဖြစ်ပါသည်။

၄။ သုတေသနတွင် ပါဝင်မည့်သူများကိုရွေးချယ်ခြင်း

သင်အား ဤ သုတေသနတွင် ပါဝင်ရန် ဖိတ်ခေါ်ခြင်းမှာ သင်ဟာ သွားနှင့်ခံတွင်းဆရာဝန်ဖြစ်ပြီး တယ်လီသွားကျန်းမာရေး စနစ်အပေါ် သင်၏ ထင်မြင်ယူဆချက်သည် မြန်မာနိုင်ငံတွင် ပိုမိုထိရောက်သော သွား နှင့်ခံတွင်း ဆေးကုသမှု စနစ် ဖော်ဆောင်နိုင်ရန် အထောက်အကူပြုမည်ဟု ယုံကြည်သောကြောင့် ဖြစ်ပါသည်။

၅။ မိမိဆန္ဒအရောက်သုတေသနတွင်ပါဝင်ခြင်း

ဤသုတေသနတွင် ပါဝင်ခြင်းမှာ သင်၏ လွတ်လပ်သော သဘောဆန္ဒ အလျောက်သာဖြစ်ပါသည်။ သင့်စိတ်ထဲတွင် ဆက်လက်မဖြေကြားလိုပါက သင်သည် သုတေသနမှ နှုတ်ထွက်ခွင့်ရှိသည်။

၆။ သုတေသနလုပ်ငန်း လုပ်ဆောင်ချက် အဆင့်ဆင့်

သင်သည်သုတေသနမေးခွန်းများဖြေကြားရာတွင် အချိန် မိနစ် (၂၀) ခန့် ကြာမြင့်မည်ဖြစ်ပြီး၊ မေးခွန်းများတွင် သင်၏ ကိုယ်ရေးအချက်အလက်များနှင့် တယ်လီသွားကျန်းမာရေး စနစ်အသုံးပြုခြင်းအပေါ် သင်၏ ထင်မြင်ယူဆချက်များ ပါဝင်ပါသည်။

သတင်းအချက်အလက်များကို လျှို့ဝှက်စွာ ထိန်းသိမ်းထားမည်ဖြစ်ပြီး ကျွန်ုပ်မှလွဲ၍ အခြားမည်သူမျှ ဝင်ရောက်ကြည့်ရှုခွင့်မရှိပါ။

၇။ အချိန်ကြာမြင့်မှု

ဤသုတေသနပြုလုပ်ရန် သင့်အနေဖြင့် မိနစ် ၂၀ ခန့် အချိန် ပေးရမည် ဖြစ်ပါသည်။

၈။ ထိခိုက်မှုများနှင့် ကိုယ်စိတ်အနှောင့်အယှက်ဖြစ်စေခြင်း

သင်သည် မေးခွန်းများ ဖြေဆိုရာတွင် သင့်ကိုယ်ရေးကိုယ်တာ အချက်အလက်များ သို့မဟုတ် လျှို့ဝှက်ထားလိုသောအကြောင်းအရာများပါနိုင်ပါသည်။ ဒါပေမယ့် ကျွန်ုပ်တို့ သင့်ကိုအခက်အခဲဖြစ်စေရန်မရည်ရွယ်ပါ။ သင့်အနေဖြင့် ကိုယ်ရေးကိုယ်တာ ဖြစ်လွန်း သော မေးခွန်းများ ဖြစ်နေသည်ဟု ခံစားရပါက ထိုမေးခွန်းကို ဖြေဆိုရန် မလိုပါ။

၉။ အကျိုးကျေးဇူးများ

ဤသုတေသနတွင် ပါဝင်ခြင်းအတွက် သင့်ကို တိုက်ရိုက် အကျိုးကျေးဇူး ရရှိမည်မဟုတ်သော်လည်း သင်၏ ပါဝင်မှုက မြန်မာနိုင်ငံရှိ သွားနှင့်ခံတွင်း ဆရာဝန်များ၏ တယ်လီသွားကျန်းမာရေး စနစ်အပေါ် ထင်မြင်မှုကို ပိုမို သိရှိနိုင် စေရန် ကူညီမည်ဖြစ်ပြီး၊ နောင်အနာဂတ်တွင် တယ်လီသွားကျန်းမာရေးစနစ်ကို ပိုမိုကောင်းမွန်စွာ အကောင်အထည် ဖော်နိုင်ရန် အထောက်အကူပေးနိုင်မည် ဖြစ်ပါသည်။

၁၀။ ကျေးဇူးတုံ့ပြန်မှု

ဤသုတေသနတွင် ပါဝင်ပေးသည့် အတွက် အခကြေးငွေတစုံတရာ ရရှိမည် မဟုတ်ပါ။

၁၁။ အချက်အလက်များလျှို့ဝှက်ထားမှု

ဤသုတေသန မှရရှိသော သတင်းအချက်အလက်များကို လျှို့ဝှက်ထားမည် ဖြစ်ပါသည်။ သင်နှင့် ပက်သက်သော အချက်အလက်များကို သုတေသန ပြုလုပ်သူများမှ လွဲ၍ မည်သူတဦးတယောက်မှ ကြည့်ရှုခွင့်မရှိပါ။

၁၂။ သုတေသနရလဒ်များဖြန့်ဝေမှု

ဤသုတေသနမှရရှိသော အချက်အလက်များကို သုတေသနအတွက် တာဝန်ရှိသူများကိုသာ မျှဝေမည်ဖြစ်ပါသည်။ သုတေသန ရလဒ်များကိုလည်း စိတ်ဝင်စားသူများ၊ မူဝါဒချမှတ်သူများအတွက်သာ ဖတ်ရှုနိုင်ရန် ထုတ်ဝေမည်ဖြစ်သည်။ သို့ရာတွင် လျှို့ဝှက်ထားရှိရမည့် အချက်အလက်များကို မျှဝေမည်မဟုတ်ပါ။

၁၃။ ငြင်းပယ်ခွင့် သို့မဟုတ် နှုတ်ထွက်ခွင့်

အကယ်၍သင်သည် ဤသုတေသန တွင် ပါဝင်လိုခြင်းမရှိပါက အချိန်မရွေး နှုတ်ထွက်ခွင့် ရှိပါသည်။

၁၄။ ဆက်သွယ်နိုင်မည့် ပုဂ္ဂိုလ်

အကယ်၍ သင့်တွင် မေးစရာမေးခွန်းရှိပါက အချိန်မရွေး ဆက်သွယ် မေးမြန်းနိုင်ပါသည်။ မေးမြန်းရန် မေးခွန်းရှိပါက ကျွန်ုပ် ဒေါက်တာရဲမြင့်အောင်၊ ဖုန်း ၀၉၄၄၃၀၀၂၅၁၇ သို့ဆက်သွယ်မေးမြန်းနိုင်ပါသည်။ ဤသုတေသန ကို ပြည်သူ့ကျန်းမာရေး တက္ကသိုလ် ရန်ကုန် သုတေသနကျင့်ဝတ် နှင့် ကျွမ်းကျင်မှုပိုင်းဆိုင်ရာ ဆန်းစစ်သုံးသပ်ရေးဘုတ်အဖွဲ့ ထံမှ ခွင့်ပြုချက် ရရှိပြီး ဖြစ်ပါသည်။ အကယ်၍သင်သည် ဘုတ်အဖွဲ့နှင့်ပက်သက်၍ သိရှိလိုသည်များရှိပါက အတွင်းရေးမှူး၊ သုတေသနကျင့်ဝတ် နှင့် ကျွမ်းကျင်မှုပိုင်းဆိုင်ရာ ဆန်းစစ်သုံးသပ်ရေးဘုတ်အဖွဲ့၊ ပြည်သူ့ကျန်းမာရေးတက္ကသိုလ်၊ ရန်ကုန်၊ အမှတ် (၂၄၆)၊ မြို့မကျောင်းလမ်း၊ လမ်းမတော် မြို့နယ်၊ ရန်ကုန် စာတိုက်သေတ္တာအမှတ် (၁၁၁၃၁)၊ ဖုန်း ၀၁-၈၃၉၅၁၃/၈၃၉၅၁၄၊ လိုင်းခွဲ ၂၀၊ ၂၆ သို့ ရုံးချိန်အတွင်း ဆက်သွယ်နိုင်ပါသည်။

အပိုင်း (ခ) သုတေသနလုပ်ငန်းတွင် ပါဝင်ရန် ခွင့်ပြုချက်

ကျွန်ုပ်သည် သွားနှင့်ခံတွင်း ဆရာဝန်များ၏ တယ်လီသွား ကျန်းမာရေး စနစ်အပေါ် ထင်မြင်ယူဆချက် အမည်ဖြင့် ပြုလုပ်မည့် သုတေသနတွင် ပါဝင်ရန် ဖိတ်ခေါ်ခြင်းခံရပါသည်။ ဤသုတေသန တွင် ပါဝင်ပါက ကျွန်ုပ်သည် သုတေသန နှင့် ပက်သက်သော မေးခွန်းများကို ဖြေဆိုရမည်ကိုသိရှိပြီးဖြစ်ပါသည်။ ဤသုတေသန တွင် ပါဝင်ခြင်းဖြင့် အကျိုးကျေးဇူးတစုံတရာ ရမည် မဟုတ်ကြောင်းကိုလည်း သိရှိပြီး ဖြစ်ပါသည်။ ဤသုတေသန တွင် ပါဝင်သော အထက်ဖော်ပြချက်များကို လည်း ဖတ်ရှုပြီး ဖြစ်ပါသည်။ ဤသုတေသန တွင် ပါဝင်ဆောင်ရွက်ရန် ငြင်းပယ် (သို့) နှုတ်ထွက် ခွင့်ရှိကြောင်းကိုလည်း သိရှိနားလည်ထားပါသည်။ ကျွန်ုပ်သည် မိမိဆန္ဒအလျောက် ဤသုတေသနတွင် ပါဝင်ရန် သဘောတူပါသည်။

သုတေသနတွင် ပါဝင်သူ၏ အမည် ----------

သုတေသနတွင် ပါဝင်သူ၏ လက်မှတ် ----------

(နေ့စွဲ) ရက်၊ လ၊ နှစ် ----------

သုတေသီအမည် ----------

သုတေသီလက်မှတ် ----------

(နေ့စွဲ) ရက်၊ လ၊ နှစ် ----------

Annex (3) Data Collection Form (English)

Section A. Sociodemographic characteristics of the respondents

No.	Question	Answer	Code
A1	Age (completed years)		
A2	Gender	(1) Male (2) Female	
A3	Qualification	(1) Bachelor (2) Master (3) Doctorate	
A4	Work Experience (years)		
A5	Work Setting of main job	(1) In service (2) Private Dental Clinic	
A6	Residence Specify your States and Regions	(1) Nay Pyi Taw (2) Yangon (3) Mandalay (4) Bago (5) Ayeyarwady (6) Magway (7) Sagaing (8) Tanintharyi (9) Chin (10) Kachin (11) Kayah (12) Kayin (13) Mon (14) Rakhine (15) Shan	
A7	Working hours per week		
A8	Daily general-purpose use of internet (hours)		

No.	Question	Answer	Code
A9	Daily practice-related use of internet (hours)		
A10	Your preferred communication tools (choose one or more option)	(1) In person (2) By phone (3) Viber (4) Email (5) Social media	
A11	Do you have any experience of teledentistry usage?	(1) Yes (2) No	
A12	In Future, will you practice teledentistry?	(1) Yes (2) No	

Section B. Dental practitioners' perception of teledentistry usefulness for the benefit of the dental practice and patients

No.	Question	Answer	Code
Dental practitioners' perception of the capability of teledentistry to improve practice			
B1	Teledentistry would provide an accurate diagnosis in a clinical setting	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree	
B2	Teledentistry would help shorten the waiting list	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
B3	Teledentistry would enhance guidelines and advice	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
B4	Teledentistry would improve the interaction between peers	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
B5	Teledentistry would provide a safe atmosphere for practicing dentistry	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	

No.	Question	Answer	Code
B6	Teledentistry would make patients' referrals more efficient	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
Dental practitioners' perception of teledentistry usefulness for the dental practice			
B7	Teledentistry would enhance clinical training and continuing education	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
B8	Teledentistry would reduce costs for the dental practices	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
B9	Teledentistry would increase treatment time spent with the patient	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
B10	Teledentistry would necessitate an extra appointment for taking photographs	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
B11	Teledentistry would save time compared with a referral letter	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	

No.	Question	Answer	Code
B12	Teledentistry would be too expensive to set up	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
B13	Teledentistry would provide adequate diagnostic information	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
Dental practitioners' perception of the usefulness of teledentistry for patients			
B14	Teledentistry would save money for patients	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
B15	Teledentistry would improve communication with patients	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
B16	Teledentistry would be helpful for patient education	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
B17	Teledentistry would help to avoid unnecessary travel to the dental clinic	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	

No.	Question	Answer	Code
B18	Teledentistry would be helpful in monitoring the patient's condition	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
B19	Teledentistry would be convenient and well received by patients	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
B20	Teledentistry would be useful for patients in remote areas	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	
B21	Teledentistry should be covered by dental insurance plans	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	

Section C. Dental practitioners's concerns about data security and patients' consent

Sr.	Question	Answer	Code
C1	Gaining patient consent for teleconsultation	(1) Very concerned (2) Little concerned (3) Not feeling either way (4) Not particularly concerned (5) Not concerned at all	
C2	Confidentiality when data are sent online	(1) Very concerned (2) Little concerned (3) Not feeling either way (4) Not particularly concerned (5) Not concerned at all	
C3	Potential for digital forgery	(1) Very concerned (2) Little concerned (3) Not feeling either way (4) Not particularly concerned (5) Not concerned at all	
C4	Incompatible hardware and software	(1) Very concerned (2) Little concerned (3) Not feeling either way (4) Not particularly concerned (5) Not concerned at all	
C5	Reliability of teledental equipment	(1) Very concerned (2) Little concerned (3) Not feeling either way (4) Not particularly concerned (5) Not concerned at all	

Section D. Dental practitioners' opinion regarding the preferred dental specialties for application of teledentistry

Sr.	Question	Answer	Code
D1	Which specialties of dentistry would you like to apply teledentistry? (choose one or more option)	(1) Oral Medicine (2) Oral Surgery (3) Orthodontics (4) Pedodontics (5) Periodontology (6) Prosthodontics (7) Conservative Dentistry (8) Community Dentistry	

Data collection form (Myanmar)

မြန်မာ သွားနှင့်ခံတွင်း ဆရာဝန်များ၏ တယ်လီသွားကျန်းမာရေး စနစ်အပေါ် ထင်မြင်ယူဆချက် အပိုင်း (က) ပါဝင်ဖြေဆိုသူများ၏ ကိုယ်ရေးအချက်အလက်များ

စဉ်	မေးခွန်းများ	အဖြေ
A1	ပြည့်ပြီးအသက်	..... နှစ်
A2	ကျား/မ	(၁) ကျား (၂) မ
A3	အမြင့်ဆုံး ပညာအရည်အချင်း	(၁) ဘွဲ့ (၂) မဟာဘွဲ့ (၃) ပါရဂူဘွဲ့
A4	လုပ်သက် (နှစ်)	..... နှစ်
A5	အဓိက လုပ်ငန်းခွင်	(၁) အစိုးရဌာန (၂) ပုဂ္ဂလိကဆေးခန်း
A6	လက်ရှိနေထိုင်ရာဒေသ (တိုင်း/ပြည်နယ်)	(၁) နေပြည်တော် (၂) ရန်ကုန် တိုင်း (၃) မန္တလေး တိုင်း (၄) ပဲခူး တိုင်း (၅) ဧရာဝတီ တိုင်း (၆) မကွေး တိုင်း (၇) စစ်ကိုင်းတိုင်း (၈) တနင်္သာရီတိုင်း (၉) ချင်းပြည်နယ် (၁၀) ကချင်ပြည်နယ် (၁၁) ကရင်ပြည်နယ် (၁၂) ကယားပြည်နယ် (၁၃) မွန်ပြည်နယ် (၁၄) ရခိုင်ပြည်နယ် (၁၅) ရှမ်းပြည်နယ်

စဉ်	မေးခွန်းများ	အဖြေ
A7	တပတ်အလုပ်ချိန် (နာရီ)	..... နာရီ
A8	နေ့စဉ် အထွေထွေ အင်တာနက် အသုံးပြုမှု (နာရီ)	..... နာရီ
A9	နေ့စဉ် လေ့လာသင်ယူမှုအတွက် အင်တာနက် အသုံးပြုမှု (နာရီ)	..... နာရီ
A10	သင်ကြိုက်နှစ်သက်ရာ ဆက်သွယ်ရေး နည်းလမ်း (တခုထက်ပို၍ဖြေဆိုနိုင်ပါသည်)	(၁) လူချင်း (၂) တယ်လီဖုန်း (၃) ဗိုက်ဘာ (၄) အီးမေလ်း (၅) လူမှုကွန်ယက်
A11	တယ်လီသွားကျန်းမာရေးစနစ်ကို အသုံးပြုဖူးပါသလား?	(၁) အသုံးပြုဖူးပါသည်။ (၂) အသုံးမပြုဖူးပါ။
A12	တယ်လီသွားကျန်းမာရေးစနစ်ကို အနာဂတ်မှာအသုံးပြုဖို့ ဆန္ဒရှိပါသလား?	(၁) ဆန္ဒရှိပါသည်။ (၂) ဆန္ဒမရှိပါ။

အပိုင်း (ခ) လူနာများ နှင့် သွားဘက်ဆိုင်ရာ ကုသမှု အတွက် အကျိုးကျေးဇူးရှိစေမည့် တယ်လီသွားကျန်းမာရေးစနစ် ၏ အသုံးဝင်မှု အပေါ် သွားနှင့်ခံတွင်း ဆရာဝန်များ၏ အမြင်

စဉ်	ထင်မြင်ယူဆချက်နှင့်ပက်သက်သည့်မေးခွန်းများ	လုံးဝသဘောတူပါ	သဘောတူပါ	သဘောထားမဟုတ်ပါ	သဘောတူပါသည်	လုံးဝသဘောတူပါသည်
B1	တယ်လီသွားကျန်းမာရေး စနစ်သည် ဆေးခန်း တွင် ရောဂါအမျိုးအမည် တိတိကျကျ သိနိုင်ရန် ပံ့ပိုးပေးနိုင်မည်။					
B2	တယ်လီ သွားကျန်းမာရေးစနစ်သည် စောင့်ဆိုင်း လူနာ စာရင်းကို လျှော့ချ ပေးနိုင်မည် ဖြစ်သည်။					
B3	တယ်လီသွားကျန်းမာရေး စနစ်သည် ကုသမှု လမ်းညွှန်ချက်များ နှင့် အကြံပြုချက်များကို တိုးတက် ကောင်းမွန်စေမည်ဖြစ်သည်။					
B4	တယ်လီသွားကျန်းမာရေး စနစ်သည် သွားဆရာဝန် အချင်းချင်း ဆက်ဆံရေးကို ပိုမိုကောင်းမွန် စေမည် ဖြစ်သည်။					
B5	တယ်လီ သွားကျန်းမာရေး စနစ်သည် သွားဘက်ဆိုင်ရာ ကုသမှုအတွက် ဘေးကင်းသော ဝန်းကျင်တစ်ခုကို ဖန်တီးပေးနိုင်မည်ဖြစ်သည်။					
B6	တယ်လီသွားကျန်းမာရေး စနစ်သည် ပိုမို ထိရောက်သော လူနာလွှဲ စနစ်ကို ရရှိစေနိုင် မည်ဖြစ်သည်။					

စဉ်	ထင်မြင်ယူဆချက်နှင့်ပက်သက်သည့်မေးခွန်းများ	လုံးဝသဘောတူပါ	သဘောတူပါ	သဘောထား မဖေးလိုပါ	သဘောတူပါသည်	လုံးဝသဘောတူပါသည်
B7	တယ်လီသွားကျန်းမာရေးစနစ်သည် သွားဘက်ဆိုင်ရာဆေးလက်တွေ့နှင့် စဉ်ဆက်မပြတ်သင်ယူမှုများကို တိုးတက်ကောင်းမွန် လာစေမည်ဖြစ်သည်။					
B8	တယ်လီသွားကျန်းမာရေးစနစ်သည် သွားဘက်ဆိုင်ရာကုသမှုများ အတွက် ကုန်ကျစရိတ်ကို လျှော့ချနိုင်မည် ဖြစ်သည်။					
B9	တယ်လီသွားကျန်းမာရေးစနစ်သည် လူနာနှင့် ကုသမှုအချိန်ကို ပိုမိုများပြားလာစေမည်ဖြစ်သည်။					
B10	တယ်လီသွားကျန်းမာရေးစနစ်သည် ဓာတ်ပုံရိုက်ခြင်း အတွက် ထပ်ဆောင်း ချိန်းဆိုရန် လိုအပ်လာမည်ဖြစ်သည်။					
B11	တယ်လီသွားကျန်းမာရေးစနစ်သည် လူနာလွှဲပြောင်းစာ ထက် အချိန်ပိုမိုသက်သာ စေမည် ဖြစ်သည်။					
B12	တယ်လီသွားကျန်းမာရေးစနစ်သည် စတင်တပ်ဆင်အသုံးပြုရန်အတွက် အလွန် ဈေးကြီးမည်ဖြစ်သည်။					
B13	တယ်လီသွားကျန်းမာရေးစနစ်သည် လုံလောက်သော ရောဂါရှာဖွေရန် အချက်အလက်များကို ပံ့ပိုးပေးနိုင်မည် ဖြစ်သည်။					
B14	တယ်လီသွားကျန်းမာရေးစနစ်သည် လူနာများအတွက် ကုန်ကျစားရိတ် သက်သာစေမည် ဖြစ်သည်။					

စဉ်	ထင်မြင်ယူဆချက်နှင့်ပက်သက်သည့်မေးခွန်းများ	လုံးဝသဘောတူပါ	သဘောတူပါ	သဘောထား မဖေးလိုပါ	သဘောတူပါသည်	လုံးဝသဘောတူပါသည်
B15	တယ်လီသွားကျန်းမာရေးစနစ်သည် လူနာများနှင့် ဆက်သွယ်မှု ကို ပိုမို တိုးတက်ကောင်းမွန် စေမည် ဖြစ်သည်။					
B16	တယ်လီသွားကျန်းမာရေးစနစ်သည် လူနာ များကို ကျန်းမာရေးအသိ ပညာပေးရန်အတွက် အသုံးဝင် မည်ဖြစ်သည်။					
B17	တယ်လီသွားကျန်းမာရေးစနစ် သွားနှင့်ခံတွင်း ဆေးခန်းသို့ မလိုအပ်ဘဲ လာရောက်ရမှုကို တားဆီး နိုင်မည်ဖြစ်သည်။					
B18	တယ်လီသွားကျန်းမာရေးစနစ်သည် လူနာ၏ အခြေအနေကို စောင့်ကြည့်ရန် အထောက်အကူ ဖြစ်မည် ဖြစ်သည်။					
B19	တယ်လီသွားကျန်းမာရေးစနစ်သည် လူနာများအတွက် အဆင်ပြေပြီး ကျေနပ်မှု ရရှိစေမည်ဖြစ်သည်။					
B20	တယ်လီသွားကျန်းမာရေးစနစ်သည် ဝေးလံခေါင်သီ နေရာများရှိ လူနာများအတွက် အသုံးဝင်မည်ဖြစ်သည်။					
B21	တယ်လီသွားကျန်းမာရေးစနစ်သည် သွားဘက်ဆိုင်ရာအာမခံအစီအစဉ်များတွင် ပါဝင်သင့်သည်။					

အပိုင်း (ဂ) အချက်အလက် လုံခြုံရေးနှင့် လူနာများ၏ သဘောတူညီမှုအပေါ် သွားနှင့်ခံတွင်း ဆရာဝန်များ၏ စိုးရိမ်ပူပန်မှုများ

စဉ်	စိုးရိမ်ပူပန်မှု နှင့် ပက်သက်သည့် မေးခွန်းများ	အလွန်စိုးရိမ်ပါသည်	အနည်းငယ် စိုးရိမ်ပါသည်	မည်သို့မျှ မစဉ်းစားပါ	ထူးထူးခြားခြား စိုးရိမ်မှုမရှိပါ	စိုးရိမ်မှုမရှိပါ
C1	တယ်လီ ဆွေးနွေးတိုင်ပင်ခြင်းများ အတွက် လူနာ၏ သဘောတူညီမှုရယူခြင်း					
C2	လူနာ၏အချက်အလက်များကို အင်တာနက်မှ တစ်ဆင့် ပို့ဆောင်သည့်အခါ ယုံကြည်စိတ်ချမှု					
C3	ဒစ်ဂျစ်တယ်နည်းပညာဖြင့် အတုအယောင်ပြုလုပ်မှု ဖြစ်နိုင်ခြေ ရှိခြင်း					
C4	ဟာဒ်ဝဲနှင့် ဆော့ဖ်ဝဲ မကိုက်ညီခြင်း					
C5	တယ်လီသွားကျန်းမာရေး ပစ္စည်းကိရိယာများအပေါ် ယုံကြည်အားထားမှု					

အပိုင်း (ဃ) တယ်လီသွားကျန်းမာရေးစနစ်ကို အသုံးပြုလိုသော သွားဘက်ဆိုင်ရာ အထူးပြု ပညာရပ်များနှင့် ပက်သက်၍ သွားနှင့်ခံတွင်းဆရာဝန်များ၏အမြင်

စဉ်	မေးခွန်း	အဖြေ
D1	တယ်လီသွားကျန်းမာရေးစနစ်ကို မည်သည့် သွားနှင့်ခံတွင်း အထူးပြု ပညာရပ်များ အတွက် အသုံးပြုချင်ပါသလဲ? (တခုထက်ပို၍ဖြေဆိုနိုင်ပါသည်)	(၁) မေးရိုးနှင့်ခံတွင်းဆေးပညာ (၂) မေးရိုးနှင့်ခံတွင်းခွဲစိတ် (၃) သွားညှိကု (၄) ကလေးသွားကျန်းမာရေး (၅) သွားဖုံးရောဂါ (၆) သွားတုဆေးပညာ (၇) သွားရောဂါကုဆေးပညာ (၈) လူထုသွားကျန်းမာရေး

Annex (4) Scoring system

No.	Question	Answer	Score
B1	Teledentistry would provide an accurate diagnosis in a clinical setting	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree	1 2 3 4 5
B2	Teledentistry would help shorten the waiting list	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B3	Teledentistry would enhance guidelines and advice	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B4	Teledentistry would improve the interaction between peers	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B5	Teledentistry would provide a safe atmosphere for practicing dentistry	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B6	Teledentistry would make patients' referrals more efficient	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5

No.	Question	Answer	Score
B7	Teledentistry would enhance clinical training and continuing education	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B8	Teledentistry would reduce costs for the dental practices	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B9	Teledentistry would increase treatment time spent with the patient	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B10	Teledentistry would necessitate an extra appointment for taking photographs	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B11	Teledentistry would save time compared with a referral letter	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B12	Teledentistry would be too expensive to set up	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5

No.	Question	Answer	Score
B13	Teledentistry would provide adequate diagnostic information	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B14	Teledentistry would save money for patients	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B15	Teledentistry would improve communication with patients	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B16	Teledentistry would be helpful for patient education	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B17	Teledentistry would help to avoid unnecessary travel to the dental clinic	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B18	Teledentistry would be helpful in monitoring the patient's condition	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5

No.	Question	Answer	Score
B19	Teledentistry would be convenient and well received by patients	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B20	Teledentistry would be useful for patients in remote areas	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5
B21	Teledentistry should be covered by dental insurance plans	(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree	1 2 3 4 5

No.	Question	Answer	Score
C1	Gaining patient consent for teleconsultation	(1) Very concerned (2) Little concerned (3) Not feeling either way (4) Not particularly concerned (5) Not concerned at all	1 2 3 4 5
C2	Confidentiality when data are sent online	(1) Very concerned (2) Little concerned (3) Not feeling either way (4) Not particularly concerned (5) Not concerned at all	1 2 3 4 5
C3	Potential for digital forgery	(1) Very concerned (2) Little concerned (3) Not feeling either way (4) Not particularly concerned (5) Not concerned at all	1 2 3 4 5
C4	Incompatible hardware and software	(1) Very concerned (2) Little concerned (3) Not feeling either way (4) Not particularly concerned (5) Not concerned at all	1 2 3 4 5
C5	Reliability of teledental equipment	(1) Very concerned (2) Little concerned (3) Not feeling either way (4) Not particularly concerned (5) Not concerned at all	1 2 3 4 5

Annex (5) Gantt Chart

Year	**2024**			
Month	**September**	**October**	**November**	**December**
Protocol Preparation				
Approval of protocol by IRB of UPH				
Preparation for data collection				
Data Collection				
Data Analysis				
Report writing				
Thesis Submission				

Annex (6) Curriculum vitae

Curriculum Vitae

Name	Dr. Ye Myint Aung
Tha-Kha Number	3495
Date of birth	21.9.1988
Nationality	Myanmar
Race	Bamar
Religion	Buddhist
Permanent address	No.61, Thittaw Street, Ahlone, Yangon.
Phone number	09 5157789, 09 443002517
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Academic qualification	B.D.S. (Ygn) 2014
	Dip.D.Sc. (Dental Implantology) 2021
Working place	Medical Officer (Dental Health),
	South District Public Health Department, Yangon.
	(3.3.2017 to date)